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1998 Sediment Trap Monitoring of Suspended Particulates in Stormwater Discharges to Thea Foss Waterway

Abstract

In-line sediment traps were deployed between December 1997 and April 1998 in several stormwater discharges to Thea Foss Waterway, located in Commencement Bay, Tacoma, Washington. The primary objective of this investigation was to determine contaminant concentrations associated with suspended particulate matter (SPM) entering the waterway. These data were obtained to supplement and compare to monitoring results collected in 1997. The overall goal of the project is to evaluate source control efforts and determine the potential for recontamination of bottom sediments in Thea Foss Waterway.

The data collected indicated that concentrations of 28 individual chemicals exceeded the Commencement Bay Sediment Quality Objectives (SQOs) in SPM. The majority of SQO violations were for polynuclear aromatic hydrocarbons (PAHs) and phthalates. The greatest number of SQO violations (22) were measured in the 15th Street drain (230), which discharges to the central portion of the waterway. High concentrations of mercury, zinc, and tributyltin were also measured in a catch basin adjacent to the Picks Cove Marina.

Comparisons of data from 1997 and 1998 indicated that low molecular weight PAH (LPAH) and high molecular weight PAH (HPAH) levels were similar in both years with the exception of the 15th street drain. Both LPAH and HPAH concentrations appear to be higher in 1998, at this location. For bis(2-ethyl hexyl) phthalate slightly higher levels were measured in 1998 in the Nalley Valley and 15th street discharges. Pentachlorophenol and 4-methyl phenol levels were substantially higher in 1998 compared to 1997 in the three major discharges to the waterway.

by Dale Norton

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Background

Water Quality Analysis Simulation Program (WASP) modeling conducted for the round 2 data evaluation report indicated that very low concentrations (in some cases below detection limits) of several contaminants in stormwater discharges could cause recontamination of bottom sediments in the waterway to unacceptable levels following cleanup activities (Hart Crowser, 1996). The primary contaminants of concern from this evaluation – mercury, polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), phthalates, chlorinated aromatics, DDD, and DDE – are all considered hydrophobic compounds, which tend to partition into particulates.

Between September 1996 and January 1997 in-line sediment traps were installed in the three largest stormwater discharges to Thea Foss Waterway to collect suspended particulate matter (SPM). The primary objective of this work by Ecology and the City of Tacoma was to determine actual contaminant levels associated with SPM entering the waterway. These data were needed to refine source loading terms for the WASP modeling effort described above.

The results of the 1996-97 monitoring indicated that concentrations of 19 individual chemicals exceeded the Commencement Bay Sediment Quality Objectives (SQOs) in SPM. The majority of SQO violations were for polynuclear aromatic hydrocarbons (PAH) and phthalates. The greatest number of individual SQO violations were measured in the 15th street drain (drain no. 230), which discharges to the central portion of the waterway (Norton, 1997).

Project Description

As a follow-up to monitoring completed in early 1997, the City of Tacoma and Ecology again collaborated on a study to collect SPM data from several Thea Foss Waterway drains. Responsibilities of each agency were as follows: Ecology prepared a study plan, constructed and provide the sediment traps, oversaw the field work, performed the laboratory analyses, and prepared a report documenting the study results. The City of Tacoma assisted in site selection and field work, supplied crews to install and retrieve the traps in the storm drains, and prepared a base map of the sampling locations.

The primary objective of the follow-up monitoring was to verify contaminant levels associated with SPM at the sites sampled in 1997 (Norton, 1997). Secondary objectives of the monitoring were to: 1) isolate potential upstream contaminant sources; and 2) increase spatial coverage of stormwater discharges to Thea Foss Waterway by establishing baseline information on additional drains.

The data generated from this project will be used to compare 1997 and 1998 contaminant levels associated with SPM in the three major stormwater discharges (East 96", Nalley Valley, and 15th Street Drain) entering the waterway. In addition, the data will be used to focus on-going source control efforts by the City of Tacoma in several of the drainage systems and provide a starting point for trend monitoring.

Methods

Site Selection

All sites sampled during the 1997 study were re-occupied during the current study. In addition, several new locations were sampled. New sites were chosen in an attempt to isolate suspected contaminant sources identified during source inspections. Each of the sampling locations and the reason for its selection is described in Table 1. The approximate location of each site is shown in Figure 1. Detail descriptions of each location are listed in Appendix A, Table A1 and Figures A1-A6.

Table 1: Summary of 1998 Stormwater Sediment Trap Sampling Locations and Analysis, Thea Foss Waterway.

Station ID	Drainage No.	Description	Target Analyses	Purpose of Site
FD1	237B	East twin 96" near mouth	%S, TOC, Metals, Semiv.	Previous Location- Major stormwater discharge
FD2	237A	West twin 96" (Nalley Valley) near mouth	%S, TOC, GS, Metals, Semiv.	Previous Location- Major stormwater discharge
FD2-A	237A	Vault outside pump station	Composited with FD2	Previous Location- Lateral line to west twin 96"
FD3	230	15th street drain main trunk at 15th and A	%S, TOC, GS, Metals, Semiv., OC Pest	Previous Location- Major stormwater discharge
FD3-A	230	Vault at 15th and A	Composited with FD3	Previous Location-Lateral line to 15th street drain
FD3-B	230	Vault at Pacific Av. and Hood St.	Composited with FD3	Previous Location- Lateral line to 15th street drain
FD3-C	230-upstream	South 11th and Yakima	%S, TOC, Hydrocarbon ID	Source Tracing
FD3-D	230-upstream	South Market between 12th and 13th streets	%S, TOC, Hydrocarbon ID	Source Tracing
FD4	237A-upstream	Sprague and South Tacoma WY.	%S, TOC, Metals,	Previous Location- Evaluate highway runoff
FD5	237A-upstream	South 18th and Cedar St.	%S, TOC, GS, Metals, Semiv.	Previous Location- Background
FD-6	235-end of pipe	21st and Dock St.	%S, TOC, Semiv., Hydrocarbon ID	Source Tracing
FD-8	Tributary to 245	Picks Cove Drain	%S, TOC, Metals, Semiv., Butyltins	Source Tracing

%S= percent solids
TOC= total organic carbon
GS= grain size
Metals= lead, mercury, and zinc
Semiv.= semivolatile organics (primarily PAH and phthalates)
OC Pest= organochlorine pesticides (primarily DDD, DDE, and DDT)

Analyses focused on contaminants measured above the Commencement Bay SQOs during the 1996-97 monitoring or identified as contaminants of concern in specific source investigations by the City of Tacoma and Ecology.

Sampling Procedures

SPM samples were collected with the use of in-line stormwater sediment traps. Construction details and performance of these traps are described in *Stormwater Sediment Trap Pilot Study* (Wilson and Norton, 1996). A diagram of the construction details of the traps is included in Appendix A, Figure A7.

Sampling was initiated on December 10, 1997 and completed April 22, 1998. Weather conditions dictated the exact timing of deployment and retrieval of the traps. Specific deployment periods for each of the sediment traps are listed in Appendix A, Table A1.

At each location an attempt was made to install two independent traps. The traps were installed near the bottom of junction boxes where possible. Alternately, the traps were mounted where eddies occurred within a pipe. Under the guidance of Ecology and the City of Tacoma project leads, City of Tacoma sewer utility crews, certified for confined space entry, installed the traps at each of the sampling locations.

At the end of the deployment period the collection bottles were removed from the mounting brackets, capped with screw closures, packaged, and placed in coolers on ice for transport the Ecology Headquarters Building. All samples were held frozen pending processing.

Processing consisted of first thawing the samples and decanting off a portion of the overlaying water. The remaining slurry was then centrifuged to isolate the particulate fraction. Manipulation of the samples during processing was accomplished using stainless steel utensils. All utensils were cleaned prior to use with sequential washes with hot tap water/liquinox® detergent, 10% HNO_3, distilled/deionized water, and acetone. The utensils were then dried in an oven to remove any solvent residual.

After processing, all replicates from individual sites, plus lateral line samples if applicable, were composited into a single sample for analysis. The following samples were submitted for analysis: FD1, FD2 (includes FD2-A), FD3 (includes FD3-A and FD3-B), FD-3C, FD-3D, FD4, FD5, FD-6, and FD-8. Due to an insufficient volume of material, the list of planned analyses was reduced at some locations. A summary of samples submitted for analysis is presented in Appendix A, Table A2.

All sample containers were glass jars with Teflon lid liners, cleaned to EPA Quality Assurance/Quality Control (QA/QC) specifications (EPA, 1990).

Quality Assurance

A summary of analytical methods and laboratories conducting analysis for the project is shown in Table 2. All samples were processed at the Ecology Headquarters Laboratory prior to being delivered to the Manchester Environmental Laboratory (MEL) for analysis. Quality of the data set was assessed with the following sample types: field and laboratory duplicates, matrix spikes, internal standards, surrogate spikes, method blanks, and laboratory control samples. Staff at MEL performed a detailed quality assurance review of the data package produced. A copy of the case narratives for these reviews is included in Appendix B.

Overall precision (sampling + laboratory analysis) of the data set was evaluated by calculating the relative percent difference (range in concentrations/mean concentration expressed in percent) between blind field duplicates (a single sample homogenized and split in the field). These data indicate that precision of the data set was excellent, being <10% in all instances.

In general, no major analytical problems were encountered in the analysis of samples for the project, with the exceptions noted below. Consequently the data generated are considered acceptable for use with the qualifiers listed in the data tables.

Mercury results were qualified as estimates based on high matrix spike recoveries. Butyltins were qualified as estimates, since it was not possible to calculate spike recoveries due to the low spiking levels relative to high native sample concentrations.

Unless otherwise noted all concentrations in this document are reported on a dry weight basis. For reference, copies of the laboratory report sheets are included in Appendix C.

Results

Contaminant Distribution

Sampling was conducted between December 10, 1997 and April 22, 1998. Rainfall records from the National Weather Service meteorological station located at the Tacoma Central Treatment Plant are shown in Figure 2. Measurable rainfall was recorded on 83 out of 133 days during the deployment period. Total precipitation for the sampling period was 19.5 inches.

Results of analysis of SPM collected from discharges to Thea Foss Waterway during the monitoring period are summarized in Table 3. Total organic carbon (TOC) concentrations were somewhat variable, ranging from 0.5% at the background site to 12% upstream in the 15th street drain (FD-3C). Grain size results indicated that at the three locations analyzed (FD2, FD3, and FD5), >70% of the sample was composed of sand size particles. Visual examination of other samples indicated that this grain size distribution is not representative of all samples collected. Several of the other samples appeared to have a much higher percentage of fines.

Lead, mercury, and zinc concentrations were relatively low in all discharges, with the exception of high concentrations of mercury (1.9 mg/kg) and zinc (740 mg/kg) in the Picks Cove catch basin (FD-8). The lowest metal concentrations were consistently measured upstream in the Nalley Valley drain at the background site (FD-5).

Thirty-nine semivolatile organics were quantified in SPM. Peak concentrations of polynuclear aromatic hydrocarbons (PAH) were measured in the 15th Street drain followed by the sample from 21st and Dock Street. The lowest PAH concentrations were present at the background station (FD-5). In all instances, the sum of high molecular weight PAH (HPAH) exceeded the sum of low molecular weight PAH (LPAH). This enrichment of HPAH relative to LPAH is commonly observed in environmental samples since weathering processes such as evaporation, photochemical oxidation, dissolution, and microbial degradation can preferentially remove PAHs with molecular weights less than that of Fluoranthene (Merrill and Wade, 1985). The distribution of PAHs observed indicates that the particulates present in each of the discharges sampled have had time to undergo some weathering.

In an attempt to evaluate potential hydrocarbon sources, three samples (FD-3C, FD-3D, and FD6) were subjected to a hydrocarbon identification procedure. All three samples showed the same basic structure of an unresolved envelope of compounds eluting in the lube oil range, with a series of small discrete peaks riding on this envelope. Lube oil is a generic term which encompasses hydraulic fluids, mineral oils, motor oils, and lubricating oils (Carrell, 1998)

In addition to the PAHs, 13 other semivolatiles were detected at concentrations exceeding 1000 ug/kg, dry. Peak concentrations of seven of these compounds were present at 21st and Dock Street (FD6). This location is tidally influenced which raises the possibility that some of the contamination observed may have originated from Thea Foss Waterway.

Low levels of DDT were detected in the 15th Street drain (8.0 ug/kg). In most instances the lowest organics concentrations were typically present at the background site which is located in the upper portion of the Nalley Valley drainage system. Fewer potential contaminant sources and a relatively low TOC content are two important factors contributing to the low contaminant levels seen at the background site.

High concentrations of tributyltin chloride (TBT), 48 mgTBTCL/kg, were present in the catch basin adjacent to the Picks Cove Marina. Reported as the TBT ion, this equates to a concentration of 43 mgTBT/kg. In 1988, the United States severely restricted the use of tributyltins in formulating antifouling paints (EPA, 1996). Monobutyltin chloride (7.8mg/kg) and dibutyltin chloride (14mg/kg) were also high in the Picks Cove sample. Mono and di-butyl tin are released into the environment through a variety of sources. Usually, their occurrence is related to degradation pathways of TBT. However, there is increasing evidence that MBT and DBT may be released directly into the environment via discharge pipes and sewage treatment discharges (Quevauviller et al., 1991). It is thought that the butyltins leach to the water in pipes (such as PVC) and are later discharged to the

environment. In addition MBT and DBT are used as a catalyst in the manufacture of polyurethane foams (EPA, 1996). Field notes for the Picks Cove sample indicated that the water surface within the catch basin was covered with broken pieces of styrofoam at the time the trap was recovered.

Contaminant Trends and Comparison to Sediment Quality Objectives

Of particular concern to source control and sediment cleanup activities in Thea Foss Waterway are chemicals which exceed the Commencement Bay SQOs. The SQOs represent contaminant concentrations above which deleterious effects would always be observed in benthic communities (EPA, 1989).

In Table 4 concentrations of selected chemicals associated with SPM from monitoring conducted in 1997 and 1998 are compared to the SQOs. In general, more chemicals were measured above the SQOS in 1998 compared to 1997 at similar locations. Twenty-eight individual chemicals exceeded the SQOs in SPM during monitoring completed in 1998. The majority of SQO violations observed were for PAHs and phthalates. Four additional organics – benzoic acid, phenol, 4-methyl phenol, and pentachlorophenol – were routinely detected above their respective SQOs in the majority of drains tested. A summary of individual chemicals exceeding the SQOs for the 1998 monitoring period is shown in Table 5. In general, a similar distribution of contaminants was seen in 1997 and 1998 with the greatest number of SQO exceedences occurring at FD-3, 15th street drain, and the fewest at FD-5 (background site).

The toxicity and bioaccumulation of TBT is a complex process that is affected by a number of factors, including organic carbon levels in sediment and water, pH, salinity, clay content, and the presence of inorganic constituents such as iron oxides (EPA, 1996). Due to its complex behavior in the aquatic environment, no sediment quality criteria have been adopted for TBT in Puget Sound sediments. Based on a review of the available literature EPA has selected a site-specific cleanup level for Hylebos Waterway. This cleanup level is based on a interstitial water concentration of 0.7ug TBT/L, which is believed to be protective of many organisms from most acute and chronic effects (EPA, 1996). Applying the EPA equilibrium partitioning approach to this interstitial water level yields a bulk sediment cleanup concentration of 17,560ug TBT/kg OC. On an organic carbon normalized basis, TBT levels in the Picks Cove catch basin were 534,000ug TBT/kg OC, which is approximately 30 times higher than the Hylebos cleanup criteria.

Figures 3-5, show a direct comparison of 1997 and 1998 levels of LPAH, HPAH, butyl benzyl phthalate, bis(2EH)phthalate, pentachlorophenol, and 4-methyl phenol collected at the same location. Similar concentrations of LPAH and HPAH were seen in 1997 and 1998. An exception to this pattern occurred at FD3 where 1998 levels of both LPAH and HPAH were higher. Butylbenzyl phthalate concentrations were similar at most sites between 1997 and 1998, but dropped substantially at the background station (FD5). For bis(2EH) phthalate, a general upward trend was observed from 1997 to 1998.

Pentachlorophenol and 4-methyl phenol levels were substantially higher in 1998 compared to 1997 in the three major discharges to the waterway. The differences in concentrations between 1997 and 1998 might be the result of variability in stormwater quality and/or discrepencies in analytical results from the two laboratories.

For these reasons, additional monitoring would be needed to verify the temporal trends noted. Preferably analysis for future monitoring would be performed by either the City of Tacoma or Manchester Laboratory which have both analyzed data sets for this project in the past.

Conclusions

In-line sediment traps were successfully deployed between December 1997 and April 1998 in several priority stormwater discharges to Thea Foss Waterway. Results of metals and organics analysis of suspended particulates indicated that concentrations of 28 individual chemicals exceeded the Commencement Bay Sediment Quality Objectives. The majority of these exceedence were for polynuclear aromatic hydrocarbons and phthalates. The greatest number of exceedences (22) were measured in the 15th Street drain which discharges to the central portion of the waterway. High concentrations of mercury, zinc, and tributyltin were also measured in the catch basin adjacent to Picks Cove Marina.

Comparisons of data from 1997 and 1998 indicated that LPAH and HPAH levels were similar in both years with the exception of the 15th street drain. Both LPAH and HPAH concentrations appear to be higher in 1998 at this location. For bis(2EH) phthalate slightly higher levels were measured in 1998 in the Nalley Valley and 15th street discharges. In contrast, slight reductions were measured between 1997 and 1998 at the background station (FD5). Pentachlorophenol and 4-methyl phenol levels were substantially higher in 1998 compared to 1997 in the three major discharges to the waterway. Additional monitoring would be needed to verify the temporal trends noted.

Recommendations

Based on data collected during the present study, the following recommendations are made:

- Investigate ongoing contaminant sources at the Picks Cove Marina, especially for mercury, zinc, and tributyltin.

- Remove sediments from the Picks Cove catch basin and implement source control measures to eliminate the release of contaminants from the site, with special emphasis on mercury, zinc, and tributyltin. Follow-up sampling should also be considered to monitor the effectiveness of source control measures implemented at the site.

- Consider conducting a loading analysis for pentachlorophenol and 4-methylphenol to the waterway, due to the high frequency of criteria violations (5 of 6 samples in 1998) for these chemicals.

- Based on loading potential, sediment trap monitoring should be continued in the three largest discharges to the waterway (East Twin 96", Nalley Valley, and 15th street drain) to evaluate changes in suspended particulate quality. For consistency, metals and organics analyses for this monitoring should be performed by either the City of Tacoma Laboratory or the Manchester Environmental Laboratory, which have both analyzed samples for this project.

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- Shirley Rollins formatted the document for publication.

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FIGURES

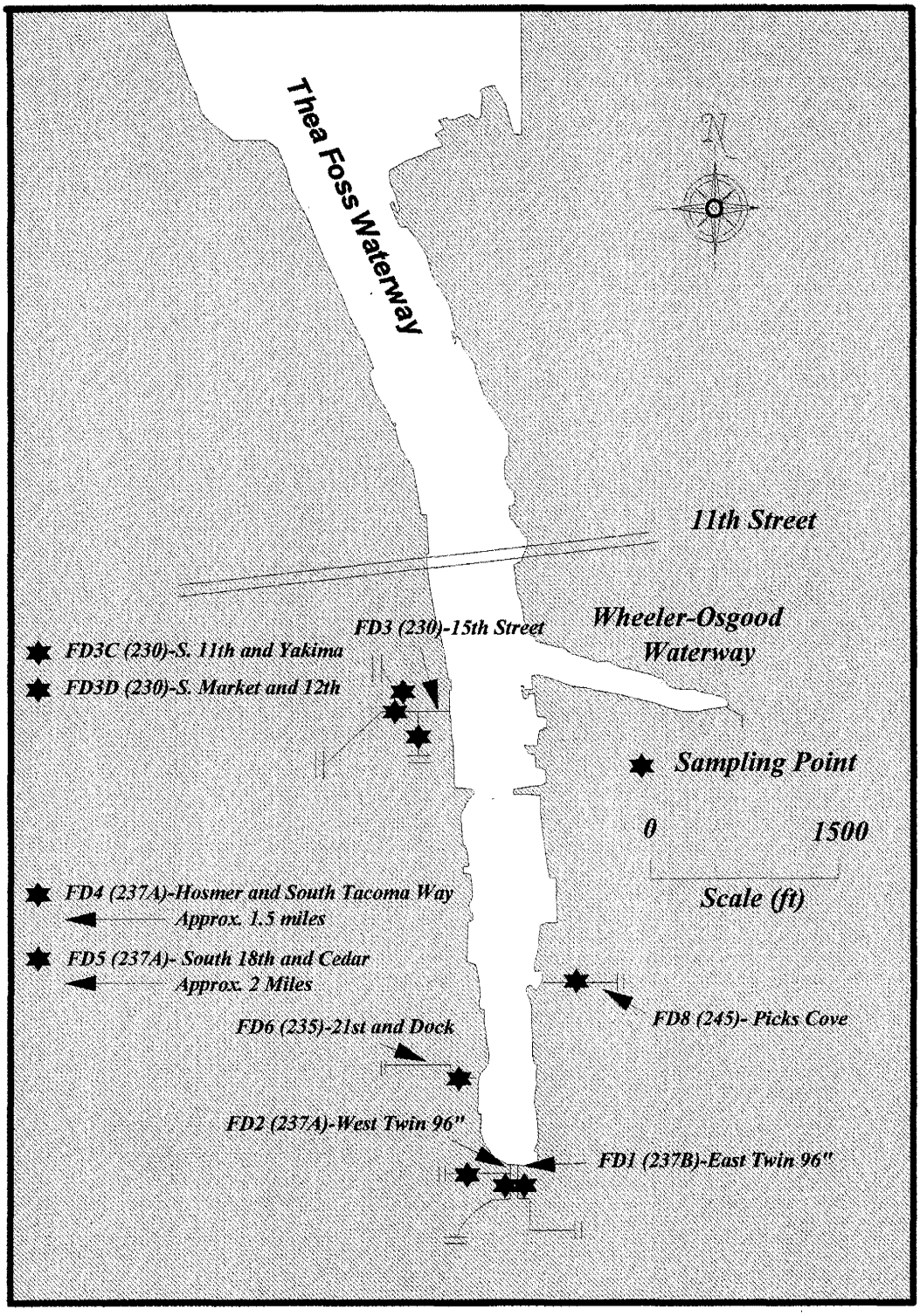

Figure 1: Approximate Locations of Sediment Trap Monitoring Sites in Thea Foss Stormwater Discharges (See Appendix A for Detailed Location Maps)

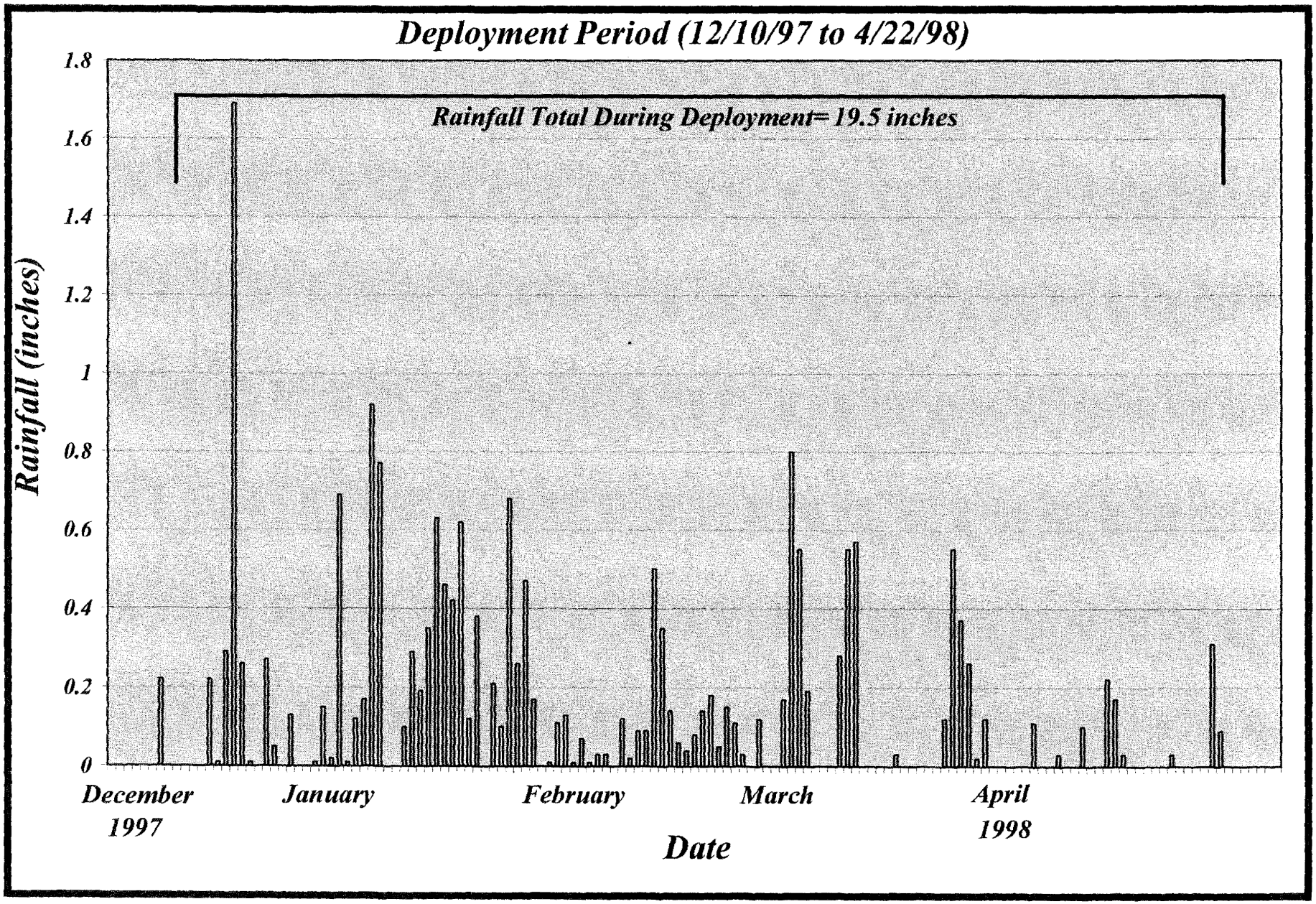

Figure 2: Rainfall Record for Sediment Trap Deployment Period.

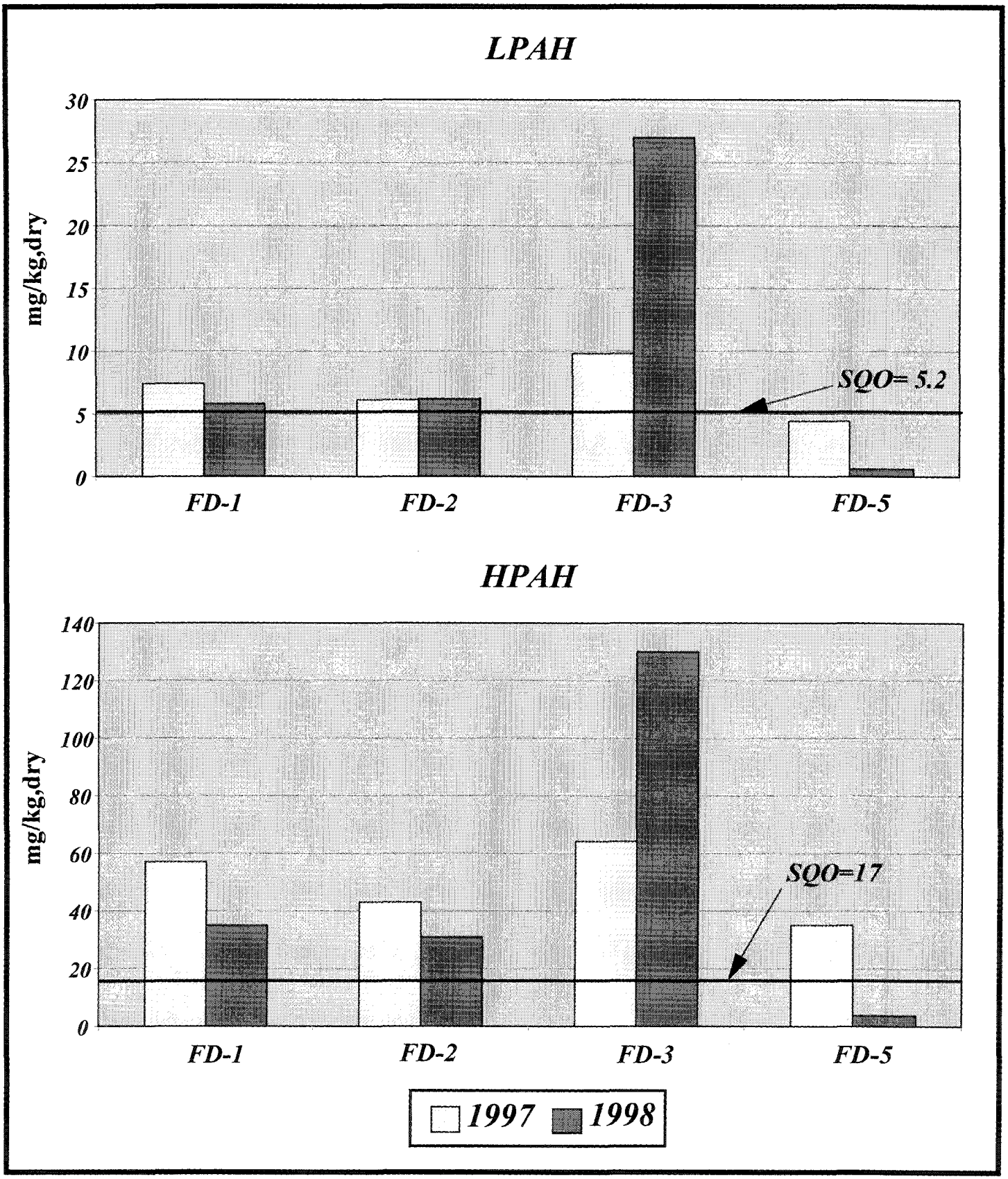

Figure 3: Comparision of PAH Levels in Stormdrain Particulates from 1997 and 1998.

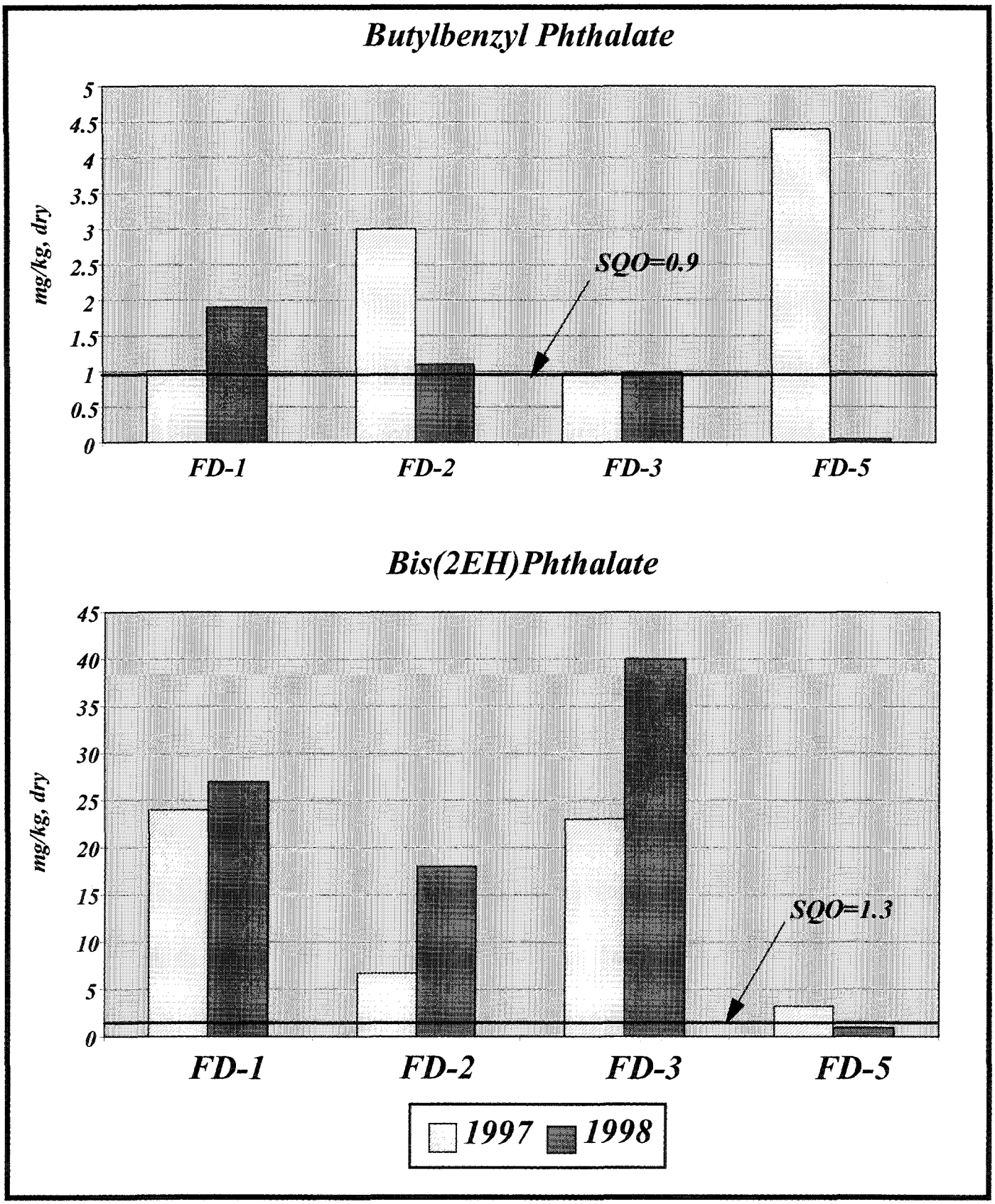

Figure 4: Comparison of Phthalate Levels in Stormdrain Particulates from 1997 and 1998.

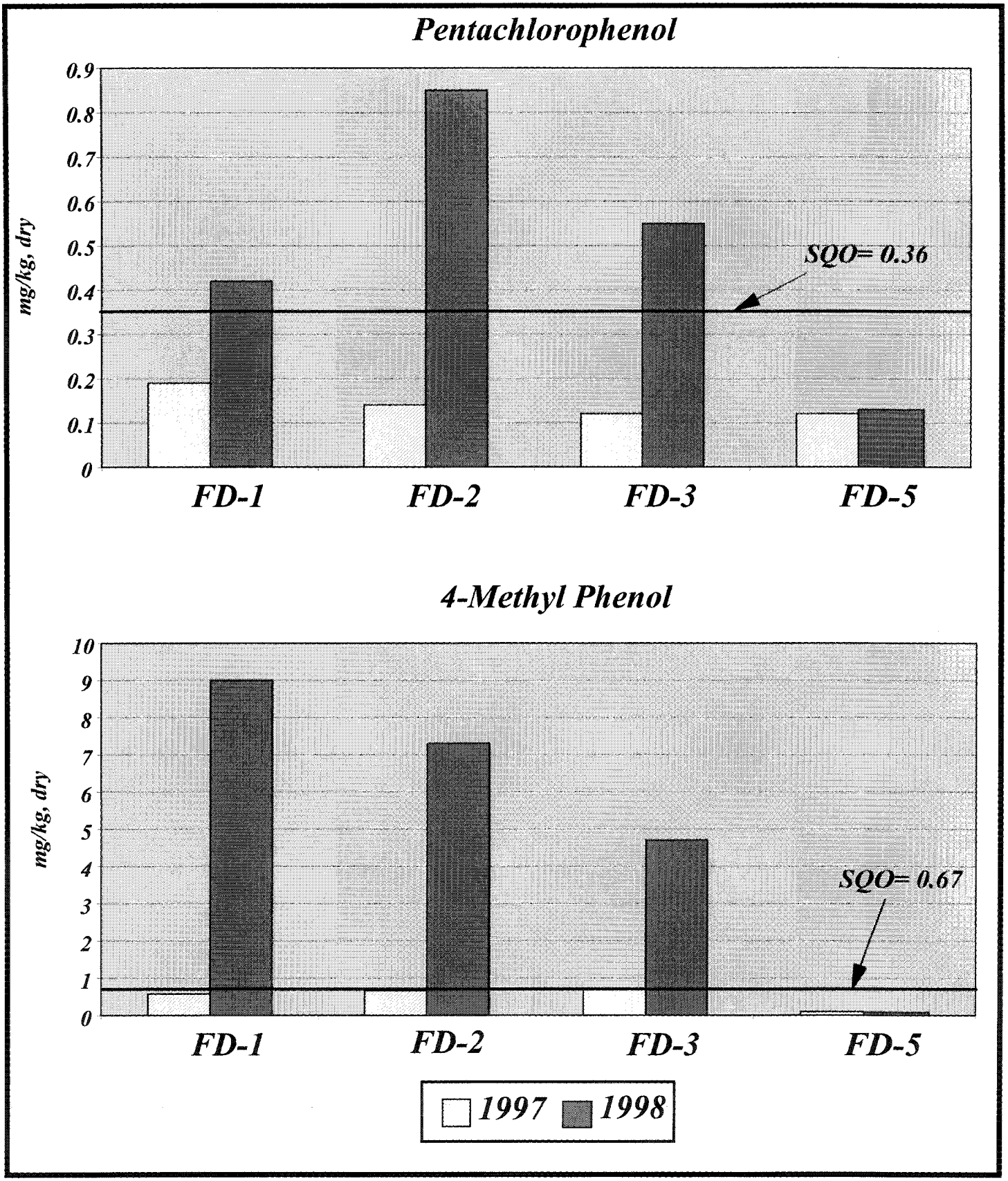

Figure 5: Comparison of Phenols Levels in Stormdrain Particulates from 1997 and 1998.

TABLES

Table 2: Summary of Analytical Methods and Laboratories for the Foss Waterway Stormwater Particulates Study.

Analysis	Method	Reference	Laboratory
Conventionals (%)			
Percent Solids	Dry @ 104°C	PSEP, 1996	Ecology/EPA Manchester
Total Organic Carbon	Combustion/CO_2 Measurement	PSEP, 1996	Ecology/EPA Manchester
Grain Size	Seive and Pipet	PSEP, 1996	Soil Technology, Inc.
Metals (mg/kg, dry)			
Lead, Zinc	ICP	PSEP, 1996	Ecology/EPA Manchester
Mercury	CVAA	PSEP, 1996	Ecology/EPA Manchester
Organics (ug/kg, dry)			
Semivolatiles PAHs Phthalates	GC/MS #8270	EPA, 1995	Ecology/EPA Manchester
Hydrocarbon ID	WTPH-HCID	Ecology, 1994	Ecology/EPA Manchester
Butyltins	GC/MS-SIM	PSEP, 1996	Ecology/EPA Manchester
Organochlorine Pesticides DDD/DDE/DDT	GC/ECD #8080	EPA, 1995	Ecology/EPA Manchester

ICP= Inductively Coupled Plasma
CVAA= Cold Vapor Atomic Absorption
GC/MS= Gas Chromatography/Mass Spectroscopy
GC/ECD= Gas Chromatography/Electron Capture Detector
GC/MS-SIM= Gas Chromatography/Mass Spectroscopy- Selective Ion Monitoring

Table 3: Summary of Compounds Detected in 1998 Particulate Samples for Foss Waterway Stormwater Discharges.

Location	East Twin 96"		West Twin 96"		-		15th Street		S. 11th and Yakima		S. Market and 12th	Hosmer and S. Tac. Wy.		18th and Cedar Background		21st and Dock		Picks Cove	
Drain No.	237B		237A		-		230		230		230	237A		237A		235		245	
Station ID	FD1		FD2		FD2(dup)		FD3		FD3C		FD3D	FD4		FD5		FD6		FD8	
Sample No. 17-	8080		8081		8082		8083		8085		8086	8087		8088		8089		8090	
Conventionals (%)																			
Total Solids	51.1		57.1		66.3		52.1		27.8		23.3	-		79.1		23.4		35.2	
TOC @ 70°C	5.1		4.4		3.4		5.6		12		5.6	-		0.5		-		-	
TOC @ 104°C	5.0		4.5		3.4		5.6		12		8.6	13	j	0.5		5.4	j	8.0	j
Grain Size																			
Gravel (>2mm)	-		13		-		12		-		-	-		9		-		-	
Sand (2mm-62um)	-		71		-		76		-		-	-		90		-		-	
Silt (62-4um)	-		15		-		11		-		-	-		1		-		-	
Clay (<4mm)	-		1		-		1		-		-	-		0		-		-	
Metals (mg/kg, dry)																			
Lead	140		110		110		170		-		-	-		77		-		190	
Mercury	0.11		0.098	j	0.13	j	0.18	j	-		-	-		0.03	j	-		1.9	j
Zinc	270		270		250		290		-		-	-		110		-		740	
Semivolatiles (ug/kg, dry)																			
Acenapthene	180		200		170		610		-		-	-		17	j	500	j	140	
Acenapthylene	59	j	110	j	76	j	140	j	-		-	-		7.4	j	400	j	190	
Napthalene	180		210		190	j	350		-		-	-		12	j	1100	j	400	
Fluorene	290		360		270		1000		-		-	-		30		910	j	330	
Anthracene	710		910		670		3000		-		-	-		78		1800	j	740	
Phenanthrene	4400		5200		4000		22000		-		-	-		470		11000		3800	
Sum LPAH	5800	j	7000	j	5400	j	27000	j						610	j	16000	j	5600	
Fluoranthene	11000		8300		6200		33000		-		-	-		820		15000		4000	
Benzo(a)anthracene	2500		2800		2000		9500		-		-	-		250		4600		790	
Chrysene	3900		4000		3200		12000		-		-	-		400		9600		1900	
Pyrene	5900		6800		5200		30000	j	-		-	-		680		15000		3600	
Benzofluoranthenes	3500		3400		5000		23000		-		-	-		710		14000		2100	
Benzo(a)pyrene	3400		3500		2400		11000		-		-	-		320		6000		720	
Dibenzo(a,h)anthracene	680		630		420		2100		-		-	-		71		2500	u	180	j
Indeno(1,2,3-cd)pyrene	2700		2800		1900		7900		-		-	-		280		5700	j	650	
Benzo(g,h,i)perylene	1900		2100		1100		5000		-		-	-		260		5000	j	730	j
Sum HPAH	35000		34000		27000		130000	j						3800		75000	j	15000	j
1-methylnapthalene	92	j	150	j	200	j	160	j	-		-	-		9.0	j	460	j	320	
2-methylnapthalene	140		190		270		250		-		-	-		15	j	910	j	480	
2,6 Dimethylnapthalene	120		180		210		160		-		-	-		7.9	j	590	j	310	
1,6,7 Trimethylnapthalen	63	j	88	j	140		91	j	-		-	-		7.5	j	350	j	150	
1-methylphenanthrene	320		410		360		990		-		-	-		42		1200	j	480	
2-methylphenanthrene	500		660		600		1600		-		-	-		50		2000	j	700	
Dibenzofuran	180		180		140		550		-		-	-		15	j	450	j	200	
Carbazole	1100		1200		970		4200		-		-	-		110		2100	j	580	
Dibenzothiophene	250		270		220		970		-		-	-		22	j	940	j	270	
Benzyl alcohol	80	u	140	u	120	u	160	u	-		-	-		19	j	3000		1300	
Benzoic acid	3600	j	4200	j	4100	j	4900	j	-		-	-		700	j	32000	u	9600	j
Retene	310		310		210	j	360		-		-	-		25	j	1500	j	700	
Caffeine	80	u	140	u	110	j	230		-		-	-		84		630	j	360	
1,1 Biphenyl	49	j	140	u	120	u	84	j	-		-	-		26	u	1300	u	110	
N-Nitrosodiphenylamine	72	j	290	u	240	u	320	u	-		-	-		52	u	730	j	180	u
Phenol	770		770	u	890		700		-		-	-		52	u	2600	u	880	
2-methylphenol	50	j	39	j	36	j	49	j	-		-	-		52	u	360	j	90	j
4-methylphenol	9000	j	6700		7800		4700		-		-	-		81		3600		800	
Pentachlorophenol	420		800		900		550	j	-		-	-		130	u	4100	j	630	
Dimethyl phthalate	72	j	500		190	j	320	u	-		-	-		52	u	2500	u	13000	
Butylbenzyl phthalate	1900		1300		910		980		-		-	-		52	u	8800		3400	
Di-n-butyl phthalate	700	u	4700	u	6000	u	1100	u	-		-	-		7100		6900	u	4400	u
Di-n-octyl phthalate	2100		1200		600	u	1100		-		-	-		130	u	6300	u	450	u
Bis(2EH)phthalate	27000		20000	j	15000		40000		-		-	-		930		96000		17000	j
Chlorinated Pesticides (ug/kg, dry)																			
Endrin	-		-		-		2.0	j	-		-	-		-				-	
4,4' DDD	-		-		-		8.1	u	-		-	-		-				-	
4,4' DDT	-		-		-		8.0	j	-		-	-		-				-	
Butyltins (ug/kg, dry)																			
Monobutyltin chloride	-		-		-		-		-		-	-		-				7800	j
Dibutyltin chloride	-		-		-		-		-		-	-		-				14000	j
Trbutyltin chloride	-		-		-		-		-		-	-		-				48000	j
Tetrabutyltin chloride	-		-		-		-		-		-	-		-				13	j

u= Not detected at detection limit shown

j= Estimated concentration

-= Not analyzed

Table 4: Comparison of Compounds Exceeding the Commencement Bay Sediment Quality Objectives in Particulate Samples Collected in 1997 and 1998 from Stormwater Discharges to Thea Foss Waterway.

Location	East Twin 96"		West Twin 96"		15th Street		Background		21st and Dock	Picks Cove	Commencement Bay
Station ID	FD-1		FD-2		FD-3		FD-5		FD-6	FD-8	SQO
Year	1998	1997	1998	1997	1998	1997	1998	1997	8089	8090	
Metals (mg/kg, dry)											
Mercury	0.11 j	0.13	0.11 j	0.15	0.18 j	0.19	0.03 j	0.021	-	1.9 j	0.59
Zinc	270	340 j	260	330 j	290	420 j	110	99 j	-	740	410
Semivolatiles (ug/kg, dry)											
Acenaphthene	180	300	190	230	610	490	17 j	150	500 j	140	500
Fluorene	290	450	320	370	1000	640	30	270	910 j	330	540
Anthracene	710	720	790	590	3000	1100	78	480	1800 j	740	960
Phenanthrene	4400	5800	4600	4800	22000	7200	470	3500	11000	3800	1500
Sum LPAH	5800 j	7400	6200 j	6100	27000 j	9800	610 j	4400	16000 j	5600	5200
Fluoranthene	11000	6100	7300	5500	33000	7100	820	4400	15000	4000	2500
Benzo(a)anthracene	2500	3700 j	2400	2900 j	9500	4500 j	250	2600 j	4600	790	1600
Chrysene	3900	4800 j	3600	4100 j	12000	5500 j	400	3200 j	9600	1900	2800
Pyrene	5900	23000 j	6000	18000 j	30000 j	25000 j	680	13000 j	15000	3600	3300
Benzofluoranthenes	3500	10000 j	4200	6900 j	23000	11000 j	710	5800 j	14000	2100	3600
Benzo(a)pyrene	3400	3900 j	3000	2800 j	11000	4600 j	320	2600 j	6000	720	1600
Dibenzo(a,h)anthracene	680	610 j	530	410 j	2100	700 j	71	440 j	2500 u	180 j	230
Indeno(1,2,3-cd)pyrene	2700	2100 j	2400	1300 j	7900	2400 j	280	1500 j	5700 j	650	690
Benzo(g,h,i)perylene	1900	2900 j	1600	1500 j	5000	3000 j	260	1800 j	5000 j	730 j	720
Sum HPAH	35000	57000 j	31000	43000 j	130000 j	64000	3800	35000 j	75000 j	15000 j	17000
Dibenzofuran	180	240	160	160	550	310	15 j	96 u	450 j	200	540
Benzyl alcohol	80 u	20 u	130 u	46	160 u	31	19 j	19 u	3000	1300	73
Benzoic acid	3600 j	490 u	4200 j	490 u	4900 j	530	700 j	480 u	32000 u	9600 j	650
N-nitrosodiphenylamine	72 j	99 u	270 u	27 j	320 u	20 u	52 u	19 u	730 j	180 u	28
Phenol	770	ND	640 j	ND	700	ND	52 u	ND	2600 u	880	420
2-methylphenol	50 j	ND	38 j	ND	49 j	ND	52 u	ND	360 j	90 j	63
4-methylphenol	9000 j	570	7300	660	4700	690	81	96 u	3600	800	670
Pentachlorophenol	420	190 j	850	140 j	550 j	120 u	130 u	120 u	4100 j	630	360
Dimethyl phthalate	72 j	100	350 j	200 j	320 u	99 u	52 u	96 u	2500 u	13000	160
Butylbenzylphthalate	1900	1000 j	1100	3000 j	980	970 j	52 u	4400 j	8800	3400	900
Di-n-butyl phthalate	700 u	270	5400 u	400	1100 u	870	7100	96 u	6900 u	4400 u	1400
Bis(2EH)phthalate	27000	24000 j	18000 j	6700 j	40000	23000 j	930	3200 j	96000	17000 E	1300
Chlorinated Pesticides (ug/kg, dry)											
4,4' DDD	-	-	-	8.0 u	8.1 u	16	-	7.4 u	-	-	16
4,4' DDT	-	-	-	8.0 u	8.0 j	320 j	-	7.4 u	-	-	34

u= Not detected at detection limit shown

j= Estimated concentrations

E= Result exceeded calibration range

-= Not analyzed

ND= Not detected

Table 5: Summary of Compounds Exceeding the Commencement Bay Sediment Quality Objectives by Station.

FD-1 (East Twin 96")	FD-2 (West Twin 96")	FD-3 (15th Street)	FD-5 (Background)	FD-6 21st and Dock Street	FD-8 Picks Cove
Sum LPAH	**Sum LPAH**	**Sum LPAH**	Benzoic Acid	**Sum LPAH**	Mercury
Phenanthrene	Phenanthrene	Acenaphthene	Di-n-butyl phthalate	Acenaphthene	Zinc
Sum HPAH	**Sum HPAH**	Flourene		Flourene	**Sum LPAH**
Flouranthene	Flouranthene	Anthracene		Anthracene	Phenanthrene
Benzo(a)anthracene	Benzo(a)anthracene	Phenanthrene		Phenanthrene	Flouranthene
Chrysene	Chrysene	**Sum HPAH**		**Sum HPAH**	Pyrene
Pyrene	Pyrene	Flouranthene		Flouranthene	Benzo(g,h,i)perylene
Benzo(a)pyrene	Benzoflouranthenes	Benzo(a)anthracene		Benzo(a)anthracene	Dimethyl Phthalate
Dibenzo(a,h)anthracene	Benzo(a)pyrene	Chrysene		Chrysene	Butylbenzyl Phthalate
Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Pyrene		Pyrene	Bis(2 ethyl hexyl) Phthalate
Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene	Benzoflouranthenes		Benzoflouranthenes	Benzyl Alcohol
Butylbenzyl Phthalate	Benzo(g,h,i)perylene	Benzo(a)pyrene		Benzo(a)pyrene	Benzoic Acid
Bis(2 ethyl hexyl) Phthalat	Dimethyl Phthalate	Dibenzo(a,h)anthracene		Indeno(1,2,3-cd)pyrene	Phenol
Benzoic Acid	Butylbenzyl Phthalate	Indeno(1,2,3-cd)pyrene		Benzo(g,h,i)perylene	2-Methylphenol
N-Nitrosophenylamine	Bis(2 ethyl hexyl) Phthalate	Benzo(g,h,i)perylene		Butylbenzyl Phthalate	4-Methylphenol
Phenol	Benzoic Acid	Dimethyl Phthalate		Bis(2 ethyl hexyl) Phthalate	Pentachlorophenol
4-Methylphenol	Phenol	Butylbenzyl Phthalate		Benzyl Alcohol	
Pentachlorophenol	4-Methylphenol	Bis(2 ethyl hexyl) Phthalate		N-Nitrosophenylamine	
	Pentachlorophenol	Dibenzofuran		2-Methylphenol	
		Benzoic Acid		4-Methylphenol	
		Phenol		Pentachlorophenol	
		4-Methyl Phenol			
18	19	22	2	21	16

Sediment Quality Objectives based on environmental risk (EPA, 1989)

APPENDICES

Appendix A

Sampling Site Descriptions and Sediment Trap Information

Table A1: Station Descriptions for 1998 Foss Waterway Stormdrain Evaluation.

Station	Drain No.	Description	Latitude	Longitude	Deployed	Retreived	Days
FD-1	237B	East Twin 96" near Mouth	47.14.45	122.25.81	2/24/98	4/22/98	57
FD-2	237A	Nalley Valley near Mouth	47.14.49	122.25.85	2/24/98	4/22/98	57
FD-2A	237A	Nalley Valley Lateral near Mouth	47.14.47	122.25.84	1/2/98	3/20/98	76
FD-3	230	15th St. Drain @ 15th and A St.	47.14.95	122.26.14	1/2/987	4/22/98	109
FD-3A	230	15th St. Drain North Lateral	47.14.95	122.26.15	12/10/97	3/20/98	100
FD-3B	230	15th St. Drain South Lateral	-	-	1/2/98	3/20/98	76
FD-3C	230	S 11th and Yakima	47.15.17	122.26.84	12/10/97	3/20/98	100
FD-3D	230	S. Market between 12th and 13th	47.15.16	122.26.45	12/10/97	3/20/98	100
FD-4	237A	Hosmer and S. Tacoma Way	47.13.95	122.27.71	1/2/98	4/22/98	109
FD-5	237A	South 18th and Cedar St.	47.14.51	122.28.50	1/2/98	3/20/98	76
FD-6	235	21st and Dock St.	-	-	2/24/98	4/22/98	57
FD-8	245	Picks Cove Marina Catchbasin	47.14.70	122.25.84	12/10/97	3/20/98	100

Latitude and Longitude in Degrees/Minutes

Table A2: Samples submitted for Analysis April 1998 for the Foss Waterway Stormdrain Project.

Station	Sample #	Description	% Solids	OC Pest	Semivolatiles*	Butyltins	Hydrocarbon ID	Hg	TOC	Pb/Zn	Grain Size
FD-1	178080	237B Composite (E. 96")	X		X			X	X	X	
FD-2	178081	237A Composite (Nalley)	X		X			X	X	X	X
FD-2D	178082	Dup of 8081	X		X			X	X	X	X
FD-3	178083	15th St Composite	X	X	X			X	X	X	X
FD-3P	178084	Dup of 8083 (Pest)	X	X							
FD-3C	178085	S. 11th and Yakima	X				X		X		
FD-3D	178086	S. Market	X				X		X		
FD-4	178087	DOT	X						X	X	
FD-5	178088	S. 18th and Cedar	X		X			X	X	X	X
FD-6	178089	21st and Dock St.	X		X		X		X		
FD-8	178090	Picks Cove Drain	X		X	X		X	X	X	

*Semivolatiles= Target Compounds include PAH, phthalates, and chlorinated aromatics

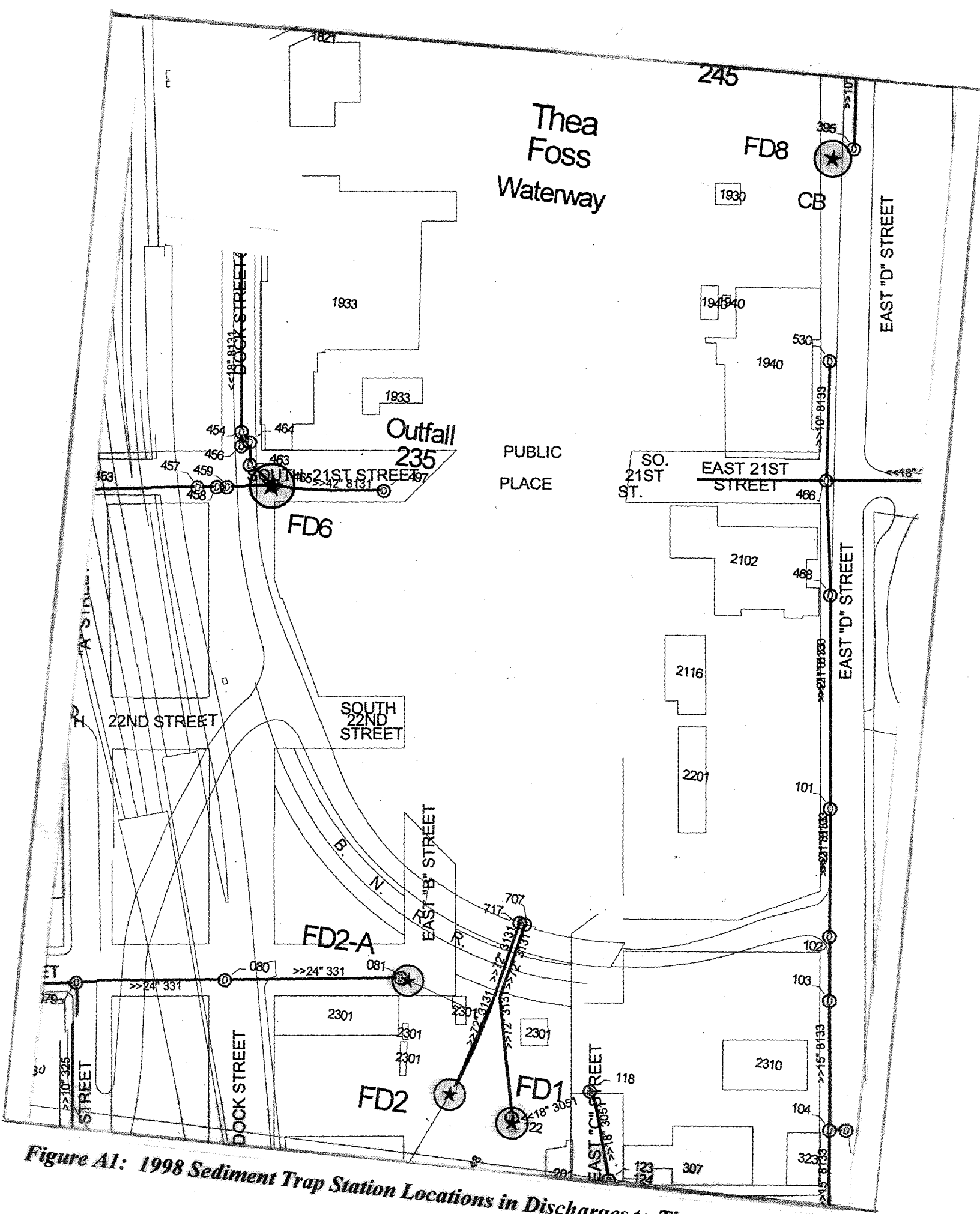

Figure A1: 1998 Sediment Trap Station Locations in Discharges to Thea Foss Waterway.

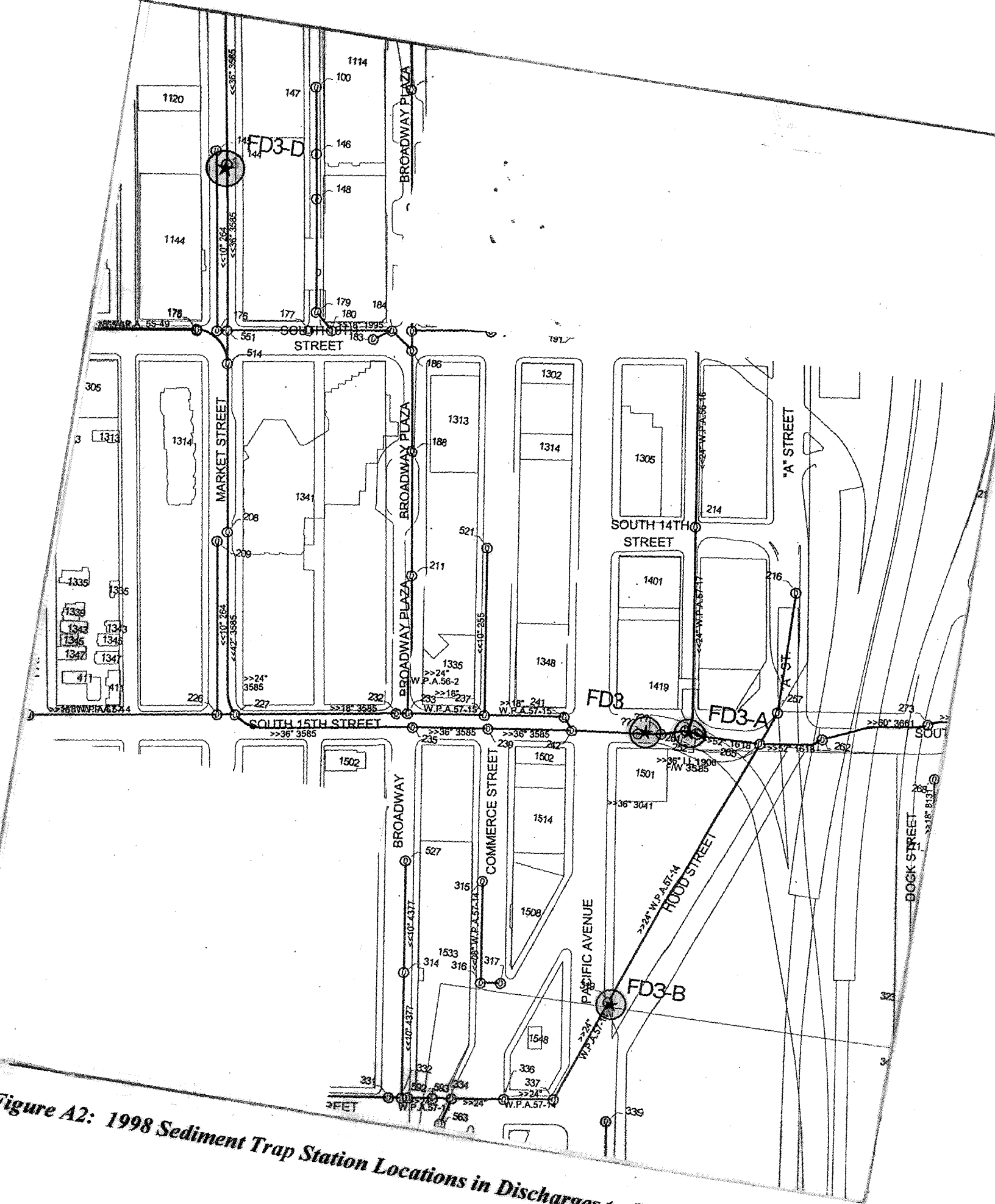

Figure A2: 1998 Sediment Trap Station Locations in Discharges to Thea Foss Waterway.

Figure A3: 1998 Sediment Trap Station Locations in Discharges to Thea Foss Waterway.

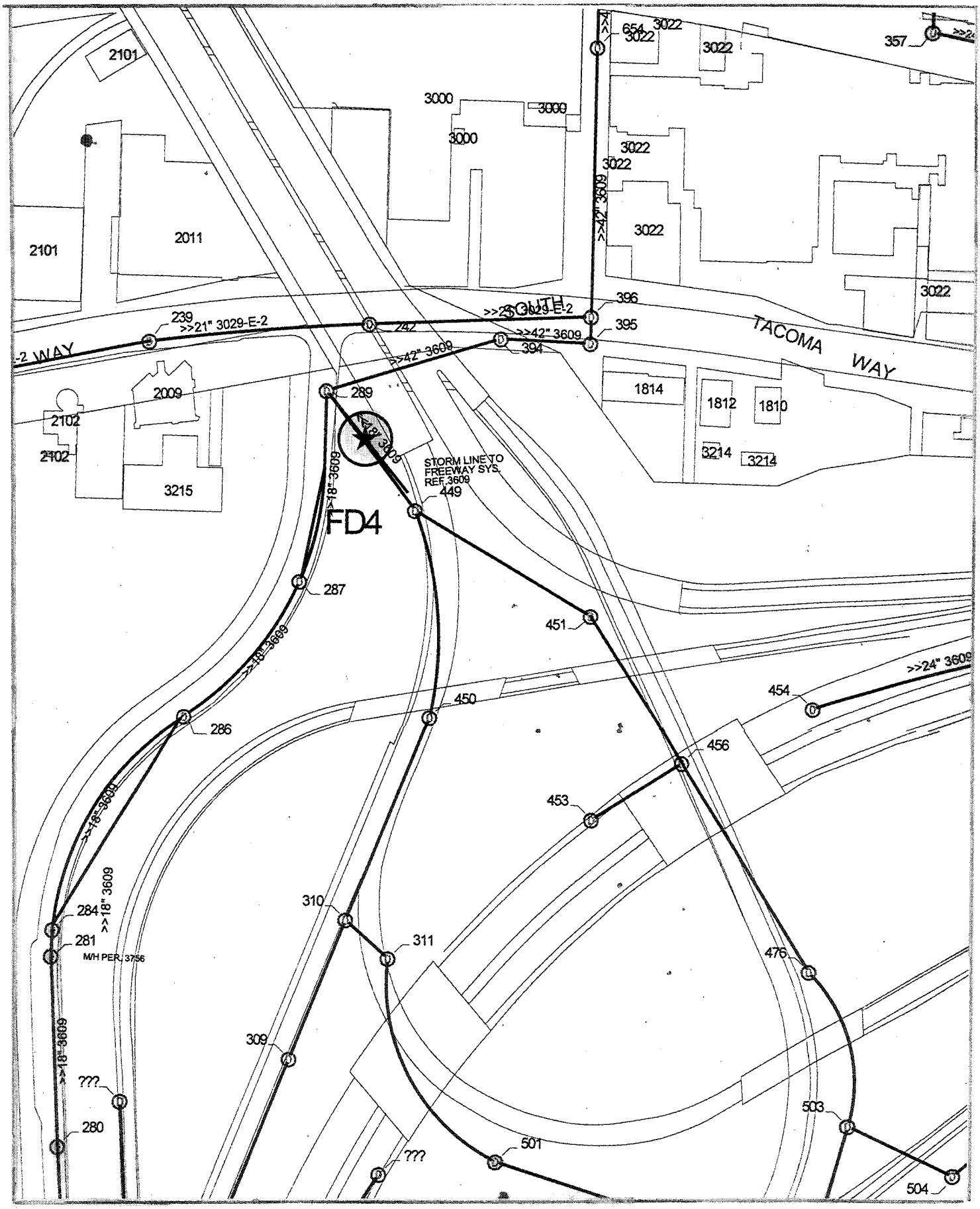

Figure A4: 1998 Sediment Trap Station Locations in Discharges to Thea Foss Waterway.

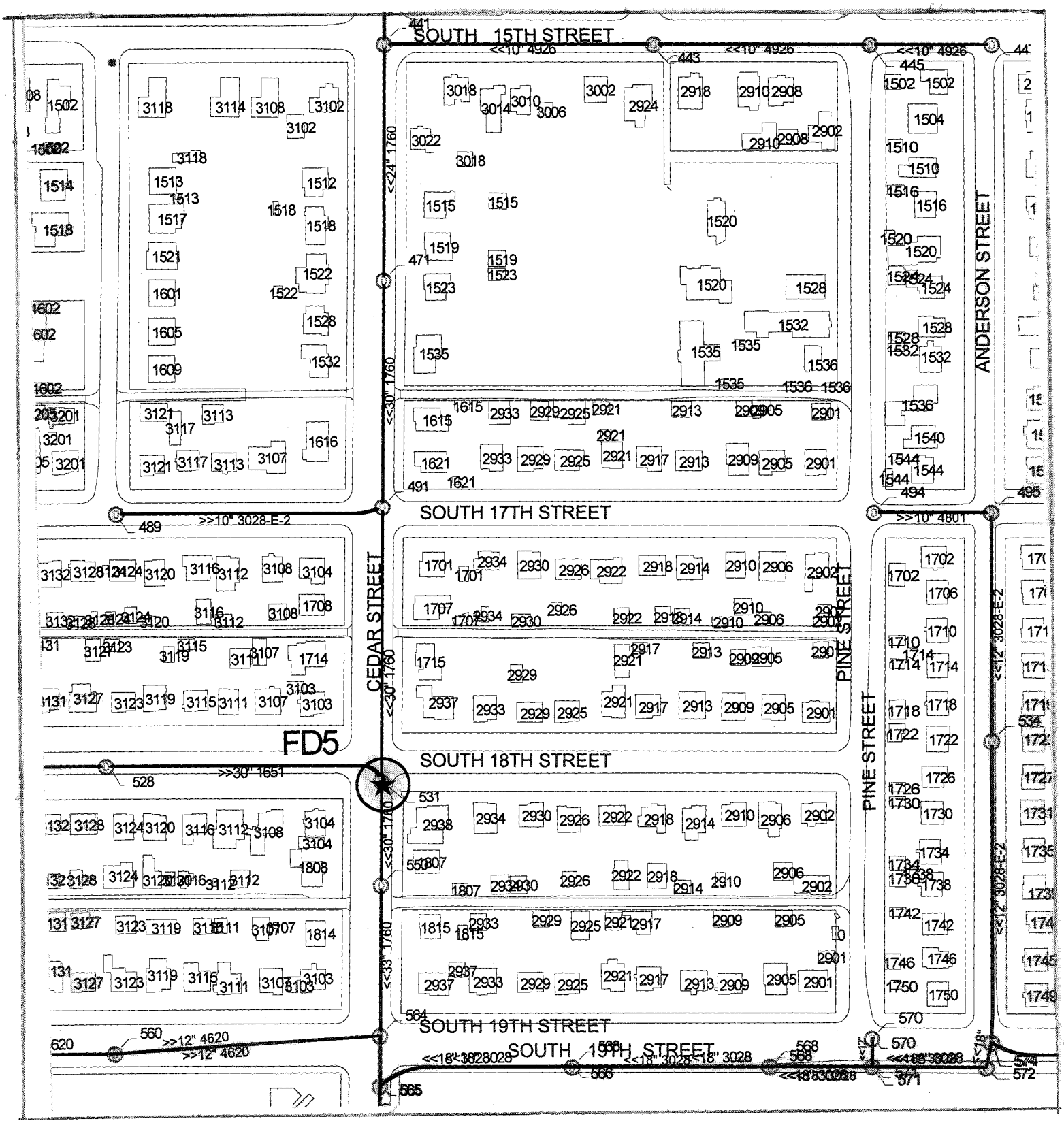

Figure A5: 1998 Sediment Trap Station Locations in Discharges to Thea Foss Waterway.

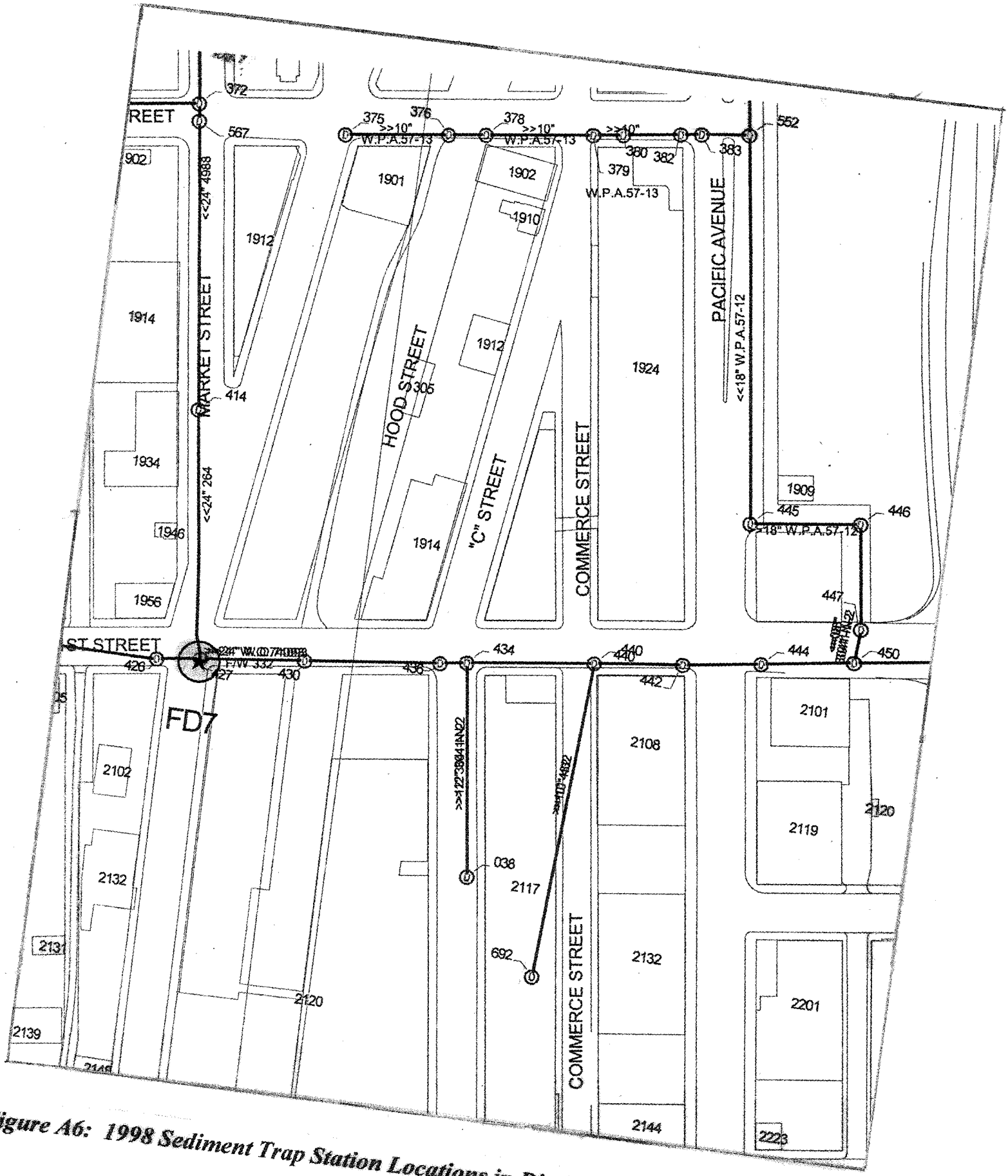

Figure A6: 1998 Sediment Trap Station Locations in Discharges to Thea Foss Waterway.

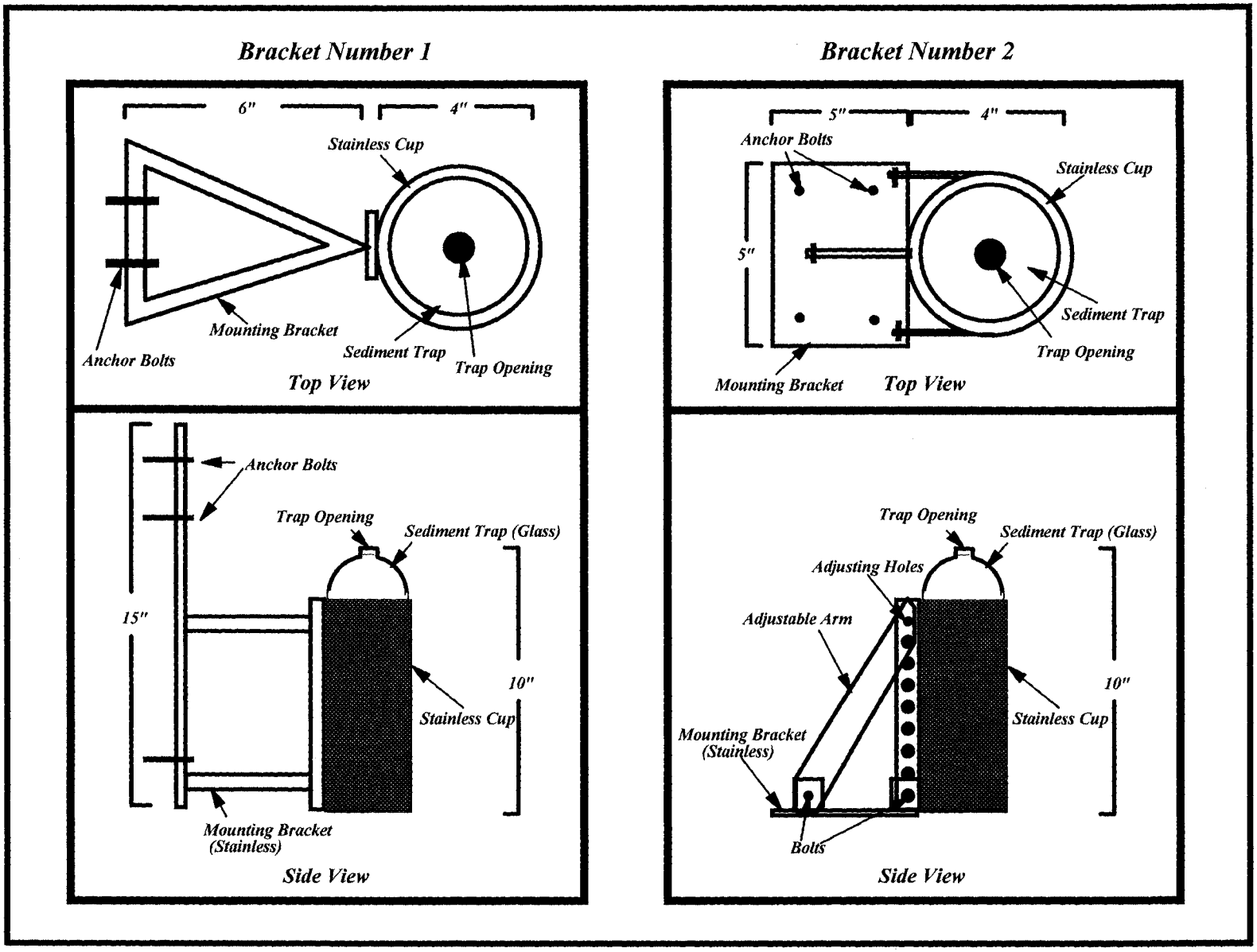

Figure A7: Construction Details of Stormwater Sediment Trap.

Appendix B

Case Narratives for Laboratory Analyses

Washington State Department of Ecology
Manchester Laboratory

June 11, 1998

TO: Dale Norton

FROM: Debbie Lacroix, Chemist

SUBJECT: General Chemistry Quality Assurance memo for the CMB In-line Sed. Traps Project

SUMMARY

The data generated by the analysis of these samples can be used noting the qualifications discussed in this memo. TOC 104°C samples 98178086, 178087, 178089, and 1780890 have been qualified as estimates. TOC 70°C samples 98178087, 178089 and 178090 were not analyzed for.

SAMPLE INFORMATION

Samples 98178080-90 from the CMB In-line Sed. Traps project were received by the Manchester Laboratory on 4-24-98 in good condition.

HOLDING TIMES

All analyses were performed within applicable EPA holding times.

ANALYSIS PERFORMANCE

Instrument Calibration

Where applicable, instrument calibration was performed before each analysis and verified by initial and verification standards and blanks. All initial and continuing calibration verification standards were within the relevant EPA control limits and a correlation of 0.995 or greater was met. All balances are calibrated yearly with calibration verification occurring monthly.

Procedural Blanks

All procedural blanks were within acceptable limits.

Precision Data

The results of the triplicate and duplicate analysis of these samples were used to evaluate the precision on this sample set. Triplicate and duplicate analyses were within their acceptance windows of +/- 20 %.

Laboratory Control Sample (LCS) Analyses

LCS analyses were within their acceptance windows of +/- 20 %.

Other Quality Assurance Issues

TOC 70°C samples 98178087, 178089 and 178090 were qualified as "NAF" for not analyzed for. There was insufficient sample to perform this analysis following the method. The percent solids analysis was performed instead as stated as the priority by the project officer. These three samples were, however analyzed after the percent solids analysis was performed at 104°C. The results of the analysis of these samples prepped at 104° C have been reported, but qualified as estimates at TOC 104°C since they were not calculated based upon the % solids analysis at 70°C as stated in the method.

TOC 104°C sample 98178086 is qualified as an estimate. The % solids analysis at 70°C and at 104°C differed greatly. The % solids at 70°C was performed two more times to verify the results. Although the resulting re-analysis provided closer results, the data should still be considered an estimate.

Please call Debbie Lacroix at 871-8812 with any questions or concerns about this project.

cc: Project File

State of Washington Department of Ecology
Manchester Environmental Laboratory
7411 Beach Dr. East Port Orchard WA. 98366

May 19, 1998

Project: CMB In-line Sed. Traps

Samples: 17-8082-83, 88

Laboratory: Soil Technology

By: Pam Covey

Case Summary

These samples required four (4) Grain Size analyses on sediment using Puget Sound Estuary Protocol (PSEP) method. There was one duplicate analysis requested. Unfortunately, the samples the duplicate was requested on could not be analyzed due to insufficient sample size so sample 8088 was analyzed in duplicate instead.

The samples were received at the Manchester Environmental Laboratory on April 24, 1998 and transported to the contract lab on April 27, 1998 for Grain Size analyses.

The analyses were reviewed for qualitative and quantitative accuracy, validity and usefulness.

The results are acceptable for use as reported.

Department of Ecology
CMB Traps Project

Case Narrative

Due to variations in water content, samples **FD-31(17-8083)** and **FD-5(17-8088)** required calculation of the weight of solids using Folk's method (*Petrology of Sedimentary Rocks*, R.L. Folk, 1974). Insufficient sample quantities prohibited representative resampling for determination using the standard method (based on subsample water content). Folk's weight of solids calculation adds the dry weight of the sample retained on the sieves (+ #230 sieve; > 62.5 microns) to the dry weight of the first pipet (4 phi) corrected for the volume of the cylinder and dispersant concentration.

Duplicate Analysis

Sample **ED-2(17-8082)** was requested for duplicate analysis, however due to very limited sample volume sample **FD-5(17-8088)** was used due to its greater sample volume.

May 27, 1998

To: Dale Norton

From: Randy Knox, Metals Chemist

Subject: CMB In-line Sed. Traps Project.....Sediment

QUALITY ASSURANCE SUMMARY

Data quality for this project met all quality assurance and quality control criteria with the exception that mercury spike data showed poor precision. No other significant quality assurance issues were noted with the data.

SAMPLE INFORMATION

The samples from the CMB In-line Sed. Traps Project were received by the Manchester Laboratory on 4/24/98 in good condition.

HOLDING TIMES

All analyses were performed within the specified method holding times for metals analysis (28 days for mercury, 180 days for all other metals).

INSTRUMENT CALIBRATION

Instrument calibration was performed before each analytical run and checked by initial calibration verification standards and blanks. Continuing calibration standards and blanks were analyzed at a frequency of 10% during the run and again at the end of the analytical run. One group of fifteen mercury samples was run without intervening calibration verification samples. The instrument response before and after these samples showed instrument stability and the data was not qualified. All initial and continuing calibration verification standards were within the relevant method control limits. AA calibration gave a correlation coefficient (r) of 0.995 or greater, also meeting method calibration requirements. ICP data included satisfactory responses for initial interference check standards. No concluding determinations were made on the ICP interference check standards. Since the instrument was stable data was not qualified.

PROCEDURAL BLANKS

The procedural blanks associated with these samples showed no analytically significant levels of analyte.

SPIKED SAMPLES ANALYSIS

Spiked and duplicate spiked sample analyses were performed on this data set. All spike recoveries, with the exception of that for mercury and that for the duplicate lead spike, were within the acceptance limits of +/- 25%. Mercury data is qualified J as estimated due to high, 131%, spike recovery. Repeating determination of the mercury spike recovery gave 73% recovery with a somewhat higher result, 0.156 mg/Kg, for sample 98178080. The data indicates sample, mercury non-homogeneity. Recovery of the duplicate lead spike was 72%, slightly below the allowed limit. Since the average lead spike recovery of both lead duplicates was within allowed limits, lead data was not qualified.

PRECISION DATA

The results of the spiked and duplicate spiked samples were used to evaluate precision on this sample set. The relative percent difference (RPD) for all analytes was within the 20% acceptance window for duplicate analysis.

SERIAL DILUTION

A five times serial dilution of one sample was analyzed by ICP and the analytical results, corrected for dilution, compared to the original sample analysis. The RPD (relative % difference) for analytes at levels 50X greater than the detection level was acceptable, within ±10%.

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

LCS analyses were within the windows established for each parameter.

Please call Randy Knox at SCAN 360-871-8811 or Jim Ross at SCAN 360-871-8808 to further discuss this project.

RLK:rlk

MANCHESTER ENVIRONMENTAL LABORATORY
7411 Beach Drive E , Port Orchard Washington 98366

July 7, 1998

Subject: **Commencement Bay Sediment Traps, Week 17**

Samples: 98178080 through 98178083, 98178088 through 98178090

Case No. 1290-98

Officer: Dale Norton

By: Karin Feddersen KF

SEMIVOLATILE ORGANICS

ANALYTICAL METHODS:

The samples were extracted following the EPA CLP and SW 846 8270 procedure. The extracts were cleaned up with Gel Permeation Chromatography (GPC) followed by silica gel chromatography. Analysis was by capillary GC/MS. Routine QA/QC procedures were performed with the analyses.

HOLDING TIMES:

The samples were stored at 4 degrees C until extraction. They were extracted and analyzed within the recommended holding times.

BLANKS:

Low levels of some analytes were detected in the laboratory blanks. An analyte is considered native to the sample when the on-column concentration is at least five times greater than in the associated method blanks. A phthalate is considered native to the sample when the concentration is at least ten times greater than in the associated method blanks.

SURROGATES:

The standard Manchester Laboratory surrogates were added to the sample prior to extraction. Surrogate recoveries were between 50 to 150% with one exception. D5-Phenol recovery was high in the dilution of sample 98178080. 4-Methylphenol may also be biased high in this sample, and the result was qualified as an estimate, ("J") in this sample.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

Sample 9817088 was spiked to evaluate recoveries in these samples. Most of the sample for one of the spikes was lost during the cleanup procedure. There was insufficient sample to perform another extraction. Therefore the results from only one of the spikes have been reported.

Results for analytes with recoveries below 50% in the remaining spike have been qualified "J" in the corresponding samples. (Aniline, 4-Chloroaniline and 3-Nitroaniline.)

Results for analytes with recoveries below 10% in the spike have been rejected (qualifier "REJ") in the corresponding samples. (Hexachlorocylopentadiene.)

ANALYTICAL COMMENTS:

Dilutions were performed for these samples. Use the dilution for all sample results qualified "E". No other dilution results have been reported.

Sample 98178090 was not diluted sufficiently to bring Bis-2-ethylhexylphthalate into the range of the calibration. This analyte is also qualified "E" in the dilution of this sample.

Bis-2-ethylhexylphthalate is qualified "J" in the dilution of sample 98178081 because the amount is slightly less than ten times the blank contamination.

The additional NOAA compounds were mistakenly analyzed for in these samples. These results have been provided at no extra charge.

The data is acceptable for use as reported.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
NAF	-	Not analyzed for.
NC	-	Not Calculated.
N	-	There is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
E	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

MANCHESTER ENVIRONMENTAL LABORATORY
7411 Beach Drive E, Port Orchard Washington 98366

August 7, 1998

Subject: **Commencement Bay**

Samples: 98178090

Case No. 1290-98

Officer: Dale Norton

By: Karin Feddersen KF
Analytical Management Unit

Organotins

ANALYTICAL METHODS:

The samples were extracted following the methods given in Puget Sound Estuary Program (PSEP) "Recommended Guidelines for Measuring Organic Compounds in Puget Sound Sediment and Tissue Samples" Recommended Methods for Organotin Compounds.

The samples were extracted by tumbling with sodium sulfate and methylene chloride/10% methanol and 0.1% by weight tropolone. After extraction the samples were solvent exchanged to hexane. The organotin compounds were hexylated using the Grignard reaction given in Krone et al (1989) including the silica gel/alumina cleanup.

Analysis was by capillary Gas Chromatography using Single Ion Monitoring (SIM) mode GC/MS. All samples are reported on a dry weight basis.

HOLDING TIMES:

The samples were stored frozen following PSEP Guidelines until extraction. All samples were analyzed within the recommended 40 days from extraction.

BLANKS:

Monobutyltin was detected in the laboratory blanks.

SURROGATES:

No surrogate recovery QC limits have been established for this method.
Recovery of tripentyl tin ranged from 65% to 109%.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

Aliquots of samples 98248095 from Budd Inlet, and 98148253 from Gray's Harbor were used for matrix spikes and analyzed with the samples. Recoveries for Terabutyltin were below 5% in all

spikes. Non-detect results for this analyte have been rejected. Detected results may be biased low and have been qualified as estimates.

Tributyltin and Dibutyltin were detected at a higher native concentration in the sample 98248095 than in the spikes of this sample. Recoveries of these analytes in one of the spikes could not be calculated (NC).

Monobutyltin was detected at a higher native concentration in the sample 98148253 than in the spikes of this sample. Recoveries of this analyte in one of the spikes could not be calculated (NC).

Therefore, all results are qualified as estimates.

ANALYTICAL COMMENTS:

Dilutions were necessary for all analytes except Tetrabutyltin in this sample. Use the results from first dilution for Dibutyltin and Monobutyltin. Use the results from second dilution for Tributyltin. analytes in samples with results qualified with "E".

Sequim Bay Reference Sediments were analyzed with the samples. These are samples which presumably were spiked with 100 ng/gm (100ug/Kg) wet weight of Tributyltin. No value for Tributyltin has been established for the Sequim Bay Reference Sediment so the accuracy of the analysis cannot be precisely determined. However, the values appear to be fairly closely associated with the surrogate recoveries. These samples are identified as OCS8175A1 and OCS8175A2.

OCS8175A1	83	ug/Kg	Tributyltin Chloride
	82	%	Tripentyltin surrogate recovery
OCS8175A2	89	ug/Kg	Tributyltin Chloride
	90	%	Tripentyltin surrogate recovery

(Note that the data sheets report these values as dry weight. The percent solids has been determined to be 60.4% for this material.)

Duplicate samples of PACS-2 were also analyzed with the samples. The value for PACS-2 has been certified as 0.98 +/- 0.13 mg/Kg Tributyltin, and 1.09 +\- 0.15 mg\Kg Dibutyltin, as elemental Tin. These values are approximately equivalent to 2800 ug/Kg as chloride. The values obtained for these samples appear to be fairly closely associated with the surrogate recoveries. These samples are identified as OCS8175A3 and OCS8175A4.

OCS8175A3	2090	ug/Kg	Tributyltin Chloride
	2000	ug/Kg	Dibutyltin Chloride
	72	%	Tripentyltin surrogate recovery
OCS8175A4	1850	ug/Kg	Tributyltin Chloride
	2010	ug/Kg	Dibutyltin Chloride
	65	%	Tripentyltin surrogate recovery

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
E	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Certified Reference Material

National Research Council Canada | Conseil national de recherches Canada

HISS-1, MESS-2, PACS-2

Marine Sediment Reference Materials for Trace Metals and other Constituents

The following tables show those constituents for which certified and information values have been established. Certified values are based on the results of determinations by at least two independent methods of analysis. The uncertainties represent 95% confidence limits for an individual sub-sample of 250 mg or greater.

Trace Metals
(milligrams per kilogram)

	HISS-1	MESS-2	PACS-2
Antimony	(0.13)*	1.09 ± 0.13	11.3 ± 2.6
Arsenic	0.801 ± 0.099	20.7 ± 0.8	26.2 ± 1.5
Beryllium	0.129 ± 0.023	2.32 ± 0.12	1.0 ± 0.2
Cadmium	0.024 ± 0.009	0.24 ± 0.01	2.11 ± 0.15
Chromium	30.0 ± 6.8†	106 ± 8	90.7 ± 4.6
Cobalt	(0.65)*	13.8 ± 1.4	11.5 ± 0.3
Copper	2.29 ± 0.37	39.3 ± 2.0	310 ± 12
Lead	3.13 ± 0.40	21.9 ± 1.2	183 ± 8
Lithium	2.83 ± 0.54	73.9 ± 0.7	32.2 ± 2.0
Manganese	66.1 ± 4.2	365 ± 21	440 ± 19
Mercury	(0.01)*	0.092 ± 0.009	3.04 ± 0.20
Molybdenum	(0.13)*	2.85 ± 0.12	5.43 ± 0.28
Nickel	2.16 ± 0.29	49.3 ± 1.8	39.5 ± 2.3
Selenium	0.050 ± 0.007	0.72 ± 0.09	0.92 ± 0.22
Silver	0.016 ± 0.002	0.18 ± 0.02	1.22 ± 0.14
Strontium	96.9 ± 11.2	125 ± 10	276 ± 30
Thallium	(0.06)*	(0.98)*	(0.6)*
Tin	(0.11)*	2.27 ± 0.42	19.8 ± 2.5
Uranium	(0.26)*	---	(3.)*
Vanadium	6.80 ± 0.78	252 ± 10	133 ± 5
Zinc	4.94 ± 0.79	172 ± 16	364 ± 23
Tributyltin (as Sn)	---	---	0.98 ± 0.13
Dibutyltin "	---	—	1.09 ± 0.15
Monobutyltin "	---	---	(0.3)*

*information value only
† see page 3

NRC · CNRC

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard Washington 98366

CASE NARRATIVE

May 7, 1998

Subject: CMB In-line Sed. Traps

Sample(s): 98178085, 86 and 89

Officer(s): Dale Norton

By: Bob Carrell
Organics Analysis Unit

HYDROCARBON IDENTIFICATION ANALYSIS

ANALYTICAL METHOD(S):

The sediment samples for hydrocarbon identification were extracted following Manchester Laboratory's standard operating procedure. A portion of each of the sediment samples was placed in disposable glass centrifuge tubes, methylene chloride was added and the samples were extracted on a vortex mixer. These extracts were then analyzed, along with various petroleum product standards, using capillary Gas Chromatography and with Flame Ionization Detection (GC/FID). To remove interfering co-extracted biogenic organic compounds these extracts were treated with concentrated sulfuric acid and silica gel and reanalyzed by GC/FID.

BLANKS:

No target compounds/products were detected in the method blanks. Hence, the blanks demonstrate the system was free from contamination.

HOLDING TIMES:

All samples were extracted and analyzed within the recommended holding times for the method.

RESULTS/COMMENTS:

All of these samples showed the same basic structure of an unresolved envelope of compounds (and a collection of small discrete peaks riding on this envelope) eluting in the lube oil range. After the cleanup using acid/silica gel, these samples lost most of their discrete peaks and the remaining compound envelope showed event greater similarity to that seen in the 30 wt. motor oil standard analyzed with them. The only appreciable difference between them was that the retention time of the apex of the envelope for the motor oil standard was slightly later than those of the samples. Given the compound fingerprint displayed by the

sample chromatograms, this means that the petroleum product seen in all samples is some type of lube oil, which is a generic term encompassing hydraulic fluids, mineral oils, motor oils and lubricating oils. It becomes quite problematic to distinguish between these petroleum products due to the similarity of their chromatographic signatures.

Manchester Environmental Laboratory

7411 Beach Drive E, Port Orchard Washington 98366

CASE NARRATIVE

August 18, 1998

Subject:	**CMB In-line Sediment Traps**
Samples:	98178083 and 98178084
Project ID:	1290-98
Project Officer:	Dale Norton
By:	Karin Feddersen KF

Chlorinated Pesticides

SUMMARY:

The data is usable as reported.

ANALYTICAL METHODS:

These samples were analyzed by EPA Method 8080 for chlorinated pesticides, employing the dual column confirmation technique.

BLANKS:

Methoxychlor was detected in one the laboratory blanks, but not in the samples.

SURROGATES:

Surrogate recoveries were within acceptable limits for all samples.

HOLDING TIMES:

The samples were extracted and analyzed within the method holding times.

SPIKED BLANK:

A blank spike, labeled OFS8119PP, was extracted and analyzed with these samples. All spike recoveries were within acceptable limits with one exception. Endrin Aldehyde was not recovered. Therefore all results for this analyte have been rejected ("REJ") in these samples.

REFERENCE SAMPLE:

Reference sample 1941a, labeled OCS8119, was extracted and analyzed with these samples. A copy of the certified concentrations is included with this report.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
NAF	-	Not analyzed for.
N	-	There is evidence the analyte is present in the sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
E	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range. The associated numerical result is an estimate.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

APPENDIX B

Noncertified Concentrations of PCB Congeners and Chlorinated Pesticides in SRM 1941a

NOTE: The noncertified values have not been confirmed by an independent analytical technique as required for certification. Although bias has not been evaluated for the procedures used, the noncertified concentrations should be useful for comparison with results obtained using similar procedures (i.e., Soxhlet solvent extraction and GC-ECD or GC-MS on a similar column).

Polychlorinated Biphenyls[a]		Concentration μg/kg (dry weight)[b,c]
PCB 8	(2,4'-Dichlorobiphenyl)[d]	1.39 ± 0.19
PCB 18	(2,2',5-Trichlorobiphenyl)[d]	1.15 ± 0.16
PCB 28	(2,4,4'-Trichlorobiphenyl)[d]	9.8 ± 3.7
PCB 31	(2,4',5-Trichlorobiphenyl)[d]	6.2 ± 2.4
PCB 151	(2,2',3,5,5',6-Hexachlorobiphenyl)[e]	2.62 ± 0.22
PCB 183	(2,2',3,4,4',5',6-Heptachlorobiphenyl)[e]	1.63 ± 0.15
PCB 187	(2,2',3,4',5,5',6-Heptachlorobiphenyl)[d,e]	7.0 ± 2.6
182	(2,2',3,4,4',5,6'-Heptachlorobiphenyl)	
Chlorinated Pesticides		
Oxychlordane[d]		2.59 ± 0.19
Dieldrin[d]		1.26 ± 0.37
4,4'-DDT[d]		1.25 ± 0.10

[a] PCB congeners are numbered according to the scheme proposed by Ballschmiter and Zell [7] and later revised by Schulte and Malisch [8] to conform with IUPAC rules; for the specific congeners mentioned in this SRM, the Ballschmiter-Zell numbers correspond to those of Schulte and Malisch. When two or more congeners are known to coelute, the PCB congener listed first is the major component and the additional congeners may be present as minor components. The quantitative results are based on the response of the congener listed first.

[b] Concentrations reported on dry weight basis; material as received contains approximately 2.2% moisture.

[c] Concentrations are the mean values determined by the technique(s) indicated; subsamples from six bottles were extracted and analyzed in duplicate; uncertainties for the measurements are a 95% confidence interval for the mean plus an allowance for differences between the analytical methods when two methods were used.

[d] Concentration determined by GC-ECD on C-18 column.

[e] Concentration determined by GC-MS on DB-5 column.

Table 2. Certified Concentrations of PCB Congeners and Chlorinated Pesticides in SRM 1941a

Polychlorinated Biphenyls[a]		Concentration μg/kg (dry weight)[b,c]
PCB 44	(2,2',3,5'-Tetrachlorobiphenyl)	4.80 ± 0.62
PCB 49	(2,2',4,5'-Tetrachlorobiphenyl)	9.5 ± 2.1
PCB 52	(2,2',5,5'-Tetrachlorobiphenyl)	6.89 ± 0.56
PCB 66	(2,3',4,4'-Tetrachlorobiphenyl)	6.8 ± 1.4
PCB 87	(2,2',3,4,5'-Pentachlorobiphenyl)	6.70 ± 0.37
PCB 95	(2,2',3,5',6-Pentachlorobiphenyl)	7.5 ± 1.1
PCB 99	(2,2',4,4',5-Pentachlorobiphenyl)	4.17 ± 0.51
PCB 101	(2,2',4,5,5'-Pentachlorobiphenyl)	11.0 ± 1.6
PCB 105	(2,3,3',4,4'-Pentachlorobiphenyl)	3.65 ± 0.27
PCB 110	(2,3,3',4',6-Pentachlorobiphenyl)	9.47 ± 0.85
PCB 118	(2,3',4,4',5-Pentachlorobiphenyl)	10.0 ± 1.1
PCB 128	(2,2',3,3',4,4'-Hexachlorobiphenyl)	1.87 ± 0.32
PCB 138	(2,2',3,4,4',5'-Hexachlorobiphenyl)	13.38 ± 0.97
163	(2,3,3',4',5,6-Hexachlorobiphenyl)	
164	(2,3,3',4',5',6-Hexachlorobiphenyl)	
PCB 149	(2,2',3,4',5',6-Hexachlorobiphenyl)	9.2 ± 1.1
PCB 153	(2,2',4,4',5,5'-Hexachlorobiphenyl)	17.6 ± 1.9
PCB 156	(2,3,3',4,4',5-Hexachlorobiphenyl)	0.93 ± 0.14
PCB 170	(2,2',3,3',4,4',5-Heptachlorobiphenyl)	3.00 ± 0.46
190	(2,3,3',4,4',5,6-Heptachlorobiphenyl)	
PCB 180	(2,2',3,4,4',5,5'-Heptachlorobiphenyl)	5.83 ± 0.58
PCB 194	(2,2',3,3',4,4',5,5'-Octachlorobiphenyl)	1.78 ± 0.23
PCB 206	(2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	3.67 ± 0.87
PCB 209	(Decachlorobiphenyl)	8.34 ± 0.49
Chlorinated Pesticides		
Hexachlorobenzene		70 ± 25
cis-Chlordane (α-Chlordane)		2.33 ± 0.56
trans-Nonachlor		1.26 ± 0.13
2,4'-DDE		0.73 ± 0.11
4,4'-DDE		6.59 ± 0.56
4,4'-DDD		5.06 ± 0.58

[a] PCB congeners are numbered according to the scheme proposed by Ballschmiter and Zell [7] and later revised by Schulte and Malisch [8] to conform with IUPAC rules; for the specific congeners mentioned in this SRM, the Ballschmiter-Zell numbers correspond to those of Schulte and Malisch. When two or more congeners are known to coelute, the PCB congener listed first is the major component and the additional congeners may be present as minor components. The quantitative results are based on the response of the congener listed first.

[b] Concentrations reported on dry weight basis; material as received contains approximately 2.2% moisture.

[c] The certified values are weighted means of results from two analytical techniques as described by Schiller and Eberhardt.[13] The uncertainty is based on a 95% confidence interval for the true concentration, and includes an allowance for differences between the analytical methods used.

Appendix C

Laboratory Data Sheets

General Chemistry

Percent Solids
Total Organic Carbon
Grain Size

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Percent Solids

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton
Date Reported: 05-MAY-98

Method: EPA160.3
Matrix: Sediment/Soil
Analyte: Solids

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
98178080		FD-1	51.1		%	04/24/98	04/29/98
98178081		FD-2	57.1		%	04/24/98	04/29/98
98178082		FD-2D	66.3		%	04/24/98	04/29/98
98178083		FD-3	52.1		%	04/24/98	04/29/98
98178085		FD-3C	27.3		%	04/24/98	04/29/98
98178085	Duplicate		28.2		%	04/24/98	04/29/98
98178086		FD-3D	23.3		%	04/24/98	04/29/98
98178088		FD-5	78.3		%	04/24/98	04/29/98
98178088	Duplicate		79.9		%	04/24/98	04/29/98
98178088	Duplicate		79.1		%	04/24/98	04/29/98
98178089		FD-6	23.4		%	04/24/98	04/29/98
98178090		FD-8	35.2		%	04/24/98	04/29/98

Authorized By: Debbi Sacroux Release Date: 6-11-98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Total Organic Carbon (70 C)

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton
Date Reported: 22-MAY-98

Method: PSEP-TOC
Matrix: Sediment/Soil
Analyte: Total Organic Carbon

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
98178080		FD-1	**5.13**		%	04/24/98	05/18/98
98178081		FD-2	**4.36**		%	04/24/98	05/18/98
98178082		FD-2D	**3.42**		%	04/24/98	05/18/98
98178083		FD-3	**5.57**		%	04/24/98	05/18/98
98178085		FD-3C	**11.9**		%	04/24/98	05/18/98
98178086		FD-3D	**5.62**		%	04/24/98	05/18/98
98178087		FD-4		NAF	%	04/24/98	05/18/98
98178088		FD-5	**0.54**		%	04/24/98	05/18/98
98178088	Duplicate		**0.52**		%	04/24/98	05/18/98
98178088	Replicate		**0.53**		%	04/24/98	05/18/98
98178089		FD-6		NAF	%	04/24/98	05/18/98
98178090		FD-8		NAF	%	04/24/98	05/18/98
GBR8138TOCA			**3.05**		%		05/18/98
GER8138TOCA			**34.3**		%		05/18/98
GER8138TOCB			**34.7**		%		05/18/98
GGL8138TOCA			**40.8**		%		05/18/98

Authorized By: Debbie Sherrow Release Date: 6-11-98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Total Organic Carbon (104 C)

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton
Date Reported: 02-JUN-98

Method: PSEP-TOCM
Matrix: Sediment/Soil
Analyte: Total Organic Carbon

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
98178080		FD-1	4.97		%	04/24/98	05/21/98
98178081		FD-2	4.47		%	04/24/98	05/21/98
98178082		FD-2D	3.43		%	04/24/98	05/21/98
98178083		FD-3	5.59		%	04/24/98	05/21/98
98178085		FD-3C	12.1		%	04/24/98	05/21/98
98178086		FD-3D	8.56	J	%	04/24/98	05/21/98
98178087		FD-4	12.5	J	%	04/24/98	05/15/98
98178088		FD-5	0.54		%	04/24/98	05/21/98
98178088	Duplicate		0.51		%	04/24/98	05/21/98
98178088	Replicate		0.52		%	04/24/98	05/21/98
98178089		FD-6	5.41	J	%	04/24/98	05/15/98
98178090		FD-8	8.07	J	%	04/24/98	05/15/98

Authorized By: Debbie Lauver Release Date: 6-11-98

Department of Ecology
CMB Traps Project
Apparent Sediment Grain Size Distribution [1]

Sample ID: ~~FD-2~~ FD-2 — 69 % SOLIDS — 17-8082

Sieve Size -->	No. 4:	No. 10:	No. 18:	No. 35:	No. 60:	No. 120:	No. 230:								
Finer than Phi Size -->								4	5	6	7	8	9	10	Balance
Grain Size -->	> 4750 microns	4750-2000 microns	2000-1000 microns	1000-500 microns	500-250 microns	250-125 microns	125-62.4 microns	62.5-31.2 microns	31.2-15.6 microns	15.6-7.8 microns	7.8-3.9 microns	3.9-1.9 microns	1.9-0.9 microns	<0.9 microns	
Percent Passing (%) -->	98	87	75	58	39	26	16	9	3	2	1	0	0	0	
Fractional Percent (%) -->	2	11	12	17	19	13	10	7	6	1	1	1	0	0	0
		13			71				15				1		

Sample ID: ~~FD-31~~ FD-3 — 56 % SOLIDS — 17-8083

Sieve Size -->	No. 4:	No. 10:	No. 18:	No. 35:	No. 60:	No. 120:	No. 230:								
Finer than Phi Size -->								4	5	6	7	8	9	10	Balance
Grain Size -->	> 4750 microns	4750-2000 microns	2000-1000 microns	1000-500 microns	500-250 microns	250-125 microns	125-62.4 microns	62.5-31.2 microns	31.2-15.6 microns	15.6-7.8 microns	7.8-3.9 microns	3.9-1.9 microns	1.9-0.9 microns	<0.9 microns	
Percent Passing (%) -->	100	88	73	53	32	20	12	8	4	2	1	1	0	0	
Fractional Percent (%) -->	0	12	15	20	21	12	8	4	4	2	1	0	1	0	0
		12			76				11				1		

Sample ID: FD-5* — 78 % SOLIDS — 17-8088 Duplicate 1

Sieve Size -->	No. 4:	No. 10:	No. 18:	No. 35:	No. 60:	No. 120:	No. 230:								
Finer than Phi Size -->								4	5	6	7	8	9	10	Balance
Grain Size -->	> 4750 microns	4750-2000 microns	2000-1000 microns	1000-500 microns	500-250 microns	250-125 microns	125-62.4 microns	62.5-31.2 microns	31.2-15.6 microns	15.6-7.8 microns	7.8-3.9 microns	3.9-1.9 microns	1.9-0.9 microns	<0.9 microns	
Percent Passing (%) -->	97	90	75	39	5	2	1	0	0	0	0	0	0	0	
Fractional Percent (%) -->	3	7	15	36	34	3	1	1	0	0	0	0	0	0	0
		10			89				1				0		

Sample ID: FD-5* — 78 % SOLIDS — 17-8088 Duplicate 2

Sieve Size -->	No. 4:	No. 10:	No. 18:	No. 35:	No. 60:	No. 120:	No. 230:								
Finer than Phi Size -->								4	5	6	7	8	9	10	Balance
Grain Size -->	> 4750 microns	4750-2000 microns	2000-1000 microns	1000-500 microns	500-250 microns	250-125 microns	125-62.4 microns	62.5-31.2 microns	31.2-15.6 microns	15.6-7.8 microns	7.8-3.9 microns	3.9-1.9 microns	1.9-0.9 microns	<0.9 microns	
Percent Passing (%) -->	98	92	76	38	5	2	1	0	0	0	0	0	0	0	
Fractional Percent (%) -->	2	6	16	38	33	3	1	1	0	0	0	0	0	0	0
		8			91				1				0		

[1] Organics included.

* For samples FD-31 and FD-5 see case narrative on page 2

Metals

Lead
Mercury
Zinc

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Inductively Coupled Plasma

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton
Date Reported: 18-MAY-98

Method: EPA200.7
Matrix: Sediment/Soil
Analyte: Lead

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
98178080		FD-1	137		mg/Kg dw	04/24/98	05/08/98
98178080	LMX1 -	Matrix Spike	81 %			04/24/98	05/08/98
98178080	LMX2 -	Matrix Spike	72 %			04/24/98	05/08/98
98178081		FD-2	111		mg/Kg dw	04/24/98	05/08/98
98178082		FD-2D	113		mg/Kg dw	04/24/98	05/08/98
98178083		FD-3	171		mg/Kg dw	04/24/98	05/08/98
98178088		FD-5	77.0		mg/Kg dw	04/24/98	05/08/98
98178090		FD-8	186		mg/Kg dw	04/24/98	05/08/98
M8121SB1			2	U	mg/Kg dw		05/08/98
M8121SL1			90 %				05/08/98
M8121SL2			7.7		mg/Kg dw		05/08/98
M8121SL3			8.0		mg/Kg dw		05/08/98

Authorized By: Randy L Knox Release Date: 5/18/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Inductively Coupled Plasma

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton
Date Reported: 13-MAY-98

Method: EPA200.7
Matrix: Sediment/Soil
Analyte: Zinc

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
98178080		FD-1	**273**		mg/Kg dw	04/24/98	05/08/98
98178080	Matrix Spike		**104 %**			04/24/98	05/08/98
98178080	Matrix Spike		**76 %**			04/24/98	05/08/98
98178081		FD-2	**268**		mg/Kg dw	04/24/98	05/08/98
98178082		FD-2D	**254**		mg/Kg dw	04/24/98	05/08/98
98178083		FD-3	**290**		mg/Kg dw	04/24/98	05/08/98
98178088		FD-5	**107**		mg/Kg dw	04/24/98	05/08/98
98178090		FD-8	**741**		mg/Kg dw	04/24/98	05/08/98
M8121SB1			1	U	mg/Kg dw		05/08/98
M8121SL1			**87 %**				05/08/98
M8121SL2			**30.2**		mg/Kg dw		05/08/98
M8121SL3			**31.6**		mg/Kg dw		05/08/98

Authorized By: Randy L Knox Release Date: 5/15/98 Page: 1

Manchester Environmental Laboratory

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Analysis Report for

Mercury

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton **Method:** EPA245.5
Date Reported: 08-MAY-98 **Matrix:** Sediment/Soil
Analyte: Mercury

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
98178080		FD-1	**0.112**	**J**	mg/Kg dw	04/24/98	05/05/98
98178080	Duplicate		**0.103**	**J**	mg/Kg dw	04/24/98	05/05/98
98178080	Matrix Spike		**131 %**			04/24/98	05/05/98
98178081		FD-2	**0.098**	**J**	mg/Kg dw	04/24/98	05/05/98
98178082		FD-2D	**0.128**	**J**	g/Kg dw	04/24/98	05/05/98
98178083		FD-3	**0.180**	**J**	mg/Kg dw	04/24/98	05/05/98
98178088		FD-5	**0.029**	**J**	mg/Kg dw	04/24/98	05/05/98
98178090		FD-8	**1.88**	**J**	mg/Kg dw	04/24/98	05/05/98
M8124SG			**100**		%		05/05/98
M8124SH			0.005	U	mg/Kg dw		05/05/98

Authorized By: Randy L Knox Release Date: 5/12/98

Organics

Semivolatiles
Organotins
Hydrocarbon Identification
Chlorinated Pesticides

Manchester Environmental Laboratory

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178080 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-1 **Date Prepared:** 05/01/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	160	U	**Acenaphthylene**	**59**	**J**
N-Nitrosodimethylamine	160	U	3-Nitroaniline	401	UJ
Aniline	80	UJ	**Acenaphthene**	**178**	
Phenol	**766**		2,4-Dinitrophenol	6420	U
Bis(2-Chloroethyl)Ether	160	U	4-Nitrophenol	401	U
2-Chlorophenol	160	U	**1,6,7-Trimethylnaphthalene**	**63**	**J**
1,3-Dichlorobenzene	160	U	**Dibenzofuran**	**177**	
1,4-Dichlorobenzene	160	U	2,4-Dinitrotoluene	401	U
1,2-Dichlorobenzene	160	U	Diethylphthalate	160	U
Benzyl Alcohol	80	U	**Fluorene**	**292**	
2-Methylphenol	**50**	**J**	4-Chlorophenyl-Phenylether	160	U
2,2'-Oxybis[1-chloropropane]	80	U	4-Nitroaniline	401	U
N-Nitroso-Di-N-Propylamine	160	U	4,6-Dinitro-2-Methylphenol	1600	U
4-Methylphenol	**6520**	**E**	**N-Nitrosodiphenylamine**	**72**	**J**
Hexachloroethane	160	U	1,2-Diphenylhydrazine	80	U
Nitrobenzene	160	U	4-Bromophenyl-Phenylether	160	U
Isophorone	160	U	Hexachlorobenzene	160	U
2-Nitrophenol	401	U	**Pentachlorophenol**	**420**	
2,4-Dimethylphenol	160	U	**Dibenzothiophene**	**251**	
Bis(2-Chloroethoxy)Methane	160	U	**Phenanthrene**	**4430**	
Benzoic Acid	**3590**	**J**	**Anthracene**	**713**	
2,4-Dichlorophenol	160	U	Caffeine	80	U
1,2,4-Trichlorobenzene	160	U	**Carbazole**	**1130**	
Naphthalene	**178**		Phenol, 4-Nonyl-	160	U
4-Chloroaniline	80	UJ	**2-Methylphenanthrene**	**496**	
Hexachlorobutadiene	160	U	**1-Methylphenanthrene**	**317**	
4-Chloro-3-Methylphenol	160	U	Di-N-Butylphthalate	695	U
2-Methylnaphthalene	**143**		**Fluoranthene**	**8270**	**E**
1-Methylnaphthalene	**92**	**J**	Benzidine	803	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**5930**	
2,4,6-Trichlorophenol	160	U	**Retene**	**309**	
2,4,5-Trichlorophenol	160	U	**Butylbenzylphthalate**	**1860**	
1,1'-Biphenyl	**49**	**J**	**Benzo(a)anthracene**	**2530**	
2-Chloronaphthalene	80	U	3,3'-Dichlorobenzidine	160	U
2,6-Dimethylnaphthalene	**117**		**Chrysene**	**3920**	
2-Nitroaniline	401	U	**Bis(2-Ethylhexyl) Phthalate**	**19400**	**E**
Dimethylphthalate	**72**	**J**	**Di-N-Octyl Phthalate**	**2080**	
2,6-Dinitrotoluene	401	U	**Benzo(b)fluoranthene**	**3040**	

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178080 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-1 **Date Prepared:** 05/01/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	3930	
Benzo[e]pyrene	2540	
Benzo(a)pyrene	3360	
Perylene	905	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	2700	
Dibenzo(a,h)anthracene	684	
Benzo(ghi)perylene	1880	

Surrogate Recoveries

2-Fluorophenol	112	%
D5-Phenol	120	%
D4-2-Chlorophenol	101	%
1,2-Dichlorobenzene-D4	74	%
D5-Nitrobenzene	81	%
2-Fluorobiphenyl	93	%
D10-Pyrene	89	%
D14-Terphenyl	91	%
Benzo(e)pyrene-d12		NAF

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178080 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-1 **Date Prepared:** 05/01/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NC	Acenaphthylene		NC
N-Nitrosodimethylamine		NC	3-Nitroaniline		NC
Aniline		NC	Acenaphthene		NC
Phenol		NC	2,4-Dinitrophenol		NC
Bis(2-Chloroethyl)Ether		NC	4-Nitrophenol		NC
2-Chlorophenol		NC	1,6,7-Trimethylnaphthalene		NC
1,3-Dichlorobenzene		NC	Dibenzofuran		NC
1,4-Dichlorobenzene		NC	2,4-Dinitrotoluene		NC
1,2-Dichlorobenzene		NC	Diethylphthalate		NC
Benzyl Alcohol		NC	Fluorene		NC
2-Methylphenol		NC	4-Chlorophenyl-Phenylether		NC
2,2'-Oxybis[1-chloropropane]		NC	4-Nitroaniline		NC
N-Nitroso-Di-N-Propylamine		NC	4,6-Dinitro-2-Methylphenol		NC
4-Methylphenol	**8980**	**J**	N-Nitrosodiphenylamine		NC
Hexachloroethane		NC	1,2-Diphenylhydrazine		NC
Nitrobenzene		NC	4-Bromophenyl-Phenylether		NC
Isophorone		NC	Hexachlorobenzene		NC
2-Nitrophenol		NC	Pentachlorophenol		NC
2,4-Dimethylphenol		NC	Dibenzothiophene		NC
Bis(2-Chloroethoxy)Methane		NC	Phenanthrene		NC
Benzoic Acid		NC	Anthracene		NC
2,4-Dichlorophenol		NC	Caffeine		NC
1,2,4-Trichlorobenzene		NC	Carbazole		NC
Naphthalene		NC	Phenol, 4-Nonyl-		NC
4-Chloroaniline		NC	2-Methylphenanthrene		NC
Hexachlorobutadiene		NC	1-Methylphenanthrene		NC
4-Chloro-3-Methylphenol		NC	Di-N-Butylphthalate		NC
2-Methylnaphthalene		NC	**Fluoranthene**	**11300**	
1-Methylnaphthalene		NC	Benzidine		NC
Hexachlorocyclopentadiene		NC	Pyrene		NC
2,4,6-Trichlorophenol		NC	Retene		NC
2,4,5-Trichlorophenol		NC	Butylbenzylphthalate		NC
1,1'-Biphenyl		NC	Benzo(a)anthracene		NC
2-Chloronaphthalene		NC	3,3'-Dichlorobenzidine		NC
2,6-Dimethylnaphthalene		NC	Chrysene		NC
2-Nitroaniline		NC	**Bis(2-Ethylhexyl) Phthalate**	**26600**	
Dimethylphthalate		NC	Di-N-Octyl Phthalate		NC
2,6-Dinitrotoluene		NC	Benzo(b)fluoranthene		NC

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178080 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-1 **Date Prepared:** 05/01/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene		NC
Benzo[e]pyrene		NC
Benzo(a)pyrene		NC
Perylene		NC
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene		NC
Dibenzo(a,h)anthracene		NC
Benzo(ghi)perylene		NC

Surrogate Recoveries

2-Fluorophenol	**149**	**%**
D5-Phenol	**161**	**%**
D4-2-Chlorophenol	**131**	**%**
1,2-Dichlorobenzene-D4	**100**	**%**
D5-Nitrobenzene	**108**	**%**
2-Fluorobiphenyl	**120**	**%**
D10-Pyrene	**135**	**%**
D14-Terphenyl	**128**	**%**

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178081 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	287	U	**Acenaphthylene**	**109**	**J**
N-Nitrosodimethylamine	287	U	3-Nitroaniline	717	UJ
Aniline	143	UJ	**Acenaphthene**	**196**	
Phenol	772	U	2,4-Dinitrophenol	11500	U
Bis(2-Chloroethyl)Ether	287	U	4-Nitrophenol	717	U
2-Chlorophenol	287	U	**1,6,7-Trimethylnaphthalene**	**88**	**J**
1,3-Dichlorobenzene	287	U	**Dibenzofuran**	**176**	
1,4-Dichlorobenzene	287	U	2,4-Dinitrotoluene	717	U
1,2-Dichlorobenzene	287	U	Diethylphthalate	287	U
Benzyl Alcohol	143	U	**Fluorene**	**360**	
2-Methylphenol	**39**	**J**	4-Chlorophenyl-Phenylether	287	U
2,2'-Oxybis[1-chloropropane]	143	U	4-Nitroaniline	717	U
N-Nitroso-Di-N-Propylamine	287	U	4,6-Dinitro-2-Methylphenol	2870	U
4-Methylphenol	**6740**		N-Nitrosodiphenylamine	287	U
Hexachloroethane	287	U	1,2-Diphenylhydrazine	143	U
Nitrobenzene	287	U	4-Bromophenyl-Phenylether	287	U
Isophorone	287	U	Hexachlorobenzene	287	U
2-Nitrophenol	717	U	**Pentachlorophenol**	**796**	
2,4-Dimethylphenol	287	U	**Dibenzothiophene**	**274**	
Bis(2-Chloroethoxy)Methane	287	U	**Phenanthrene**	**5180**	
Benzoic Acid	**4240**	**J**	**Anthracene**	**912**	
2,4-Dichlorophenol	287	U	Caffeine	143	U
1,2,4-Trichlorobenzene	287	U	**Carbazole**	**1210**	
Naphthalene	**211**	**J**	Phenol, 4-Nonyl-	287	U
4-Chloroaniline	143	UJ	**2-Methylphenanthrene**	**658**	
Hexachlorobutadiene	287	U	**1-Methylphenanthrene**	**413**	
4-Chloro-3-Methylphenol	287	U	Di-N-Butylphthalate	4690	U
2-Methylnaphthalene	**188**		**Fluoranthene**	**8310**	
1-Methylnaphthalene	**147**	**J**	Benzidine	1430	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**6800**	
2,4,6-Trichlorophenol	287	U	**Retene**	**306**	
2,4,5-Trichlorophenol	287	U	**Butylbenzylphthalate**	**1270**	
1,1'-Biphenyl	143	U	**Benzo(a)anthracene**	**2810**	
2-Chloronaphthalene	143	U	3,3'-Dichlorobenzidine	287	U
2,6-Dimethylnaphthalene	**176**		**Chrysene**	**4020**	
2-Nitroaniline	717	U	**Bis(2-Ethylhexyl) Phthalate**	**19400**	**E**
Dimethylphthalate	**501**		**Di-N-Octyl Phthalate**	**1210**	
2,6-Dinitrotoluene	717	U	**Benzo(b)fluoranthene**	**4830**	

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178081 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	1990	
Benzo[e]pyrene	2350	
Benzo(a)pyrene	3450	
Perylene	1000	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	2770	
Dibenzo(a,h)anthracene	633	
Benzo(ghi)perylene	2100	

Surrogate Recoveries

2-Fluorophenol	126	%
D5-Phenol	135	%
D4-2-Chlorophenol	111	%
1,2-Dichlorobenzene-D4	76	%
D5-Nitrobenzene	102	%
2-Fluorobiphenyl	104	%
D10-Pyrene	104	%
D14-Terphenyl	103	%

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178081 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NC	Acenaphthylene		NC
N-Nitrosodimethylamine		NC	3-Nitroaniline		NC
Aniline		NC	Acenaphthene		NC
Phenol		NC	2,4-Dinitrophenol		NC
Bis(2-Chloroethyl)Ether		NC	4-Nitrophenol		NC
2-Chlorophenol		NC	1,6,7-Trimethylnaphthalene		NC
1,3-Dichlorobenzene		NC	Dibenzofuran		NC
1,4-Dichlorobenzene		NC	2,4-Dinitrotoluene		NC
1,2-Dichlorobenzene		NC	Diethylphthalate		NC
Benzyl Alcohol		NC	Fluorene		NC
2-Methylphenol		NC	4-Chlorophenyl-Phenylether		NC
2,2'-Oxybis[1-chloropropane]		NC	4-Nitroaniline		NC
N-Nitroso-Di-N-Propylamine		NC	4,6-Dinitro-2-Methylphenol		NC
4-Methylphenol		NC	N-Nitrosodiphenylamine		NC
Hexachloroethane		NC	1,2-Diphenylhydrazine		NC
Nitrobenzene		NC	4-Bromophenyl-Phenylether		NC
Isophorone		NC	Hexachlorobenzene		NC
2-Nitrophenol		NC	Pentachlorophenol		NC
2,4-Dimethylphenol		NC	Dibenzothiophene		NC
Bis(2-Chloroethoxy)Methane		NC	Phenanthrene		NC
Benzoic Acid		NC	Anthracene		NC
2,4-Dichlorophenol		NC	Caffeine		NC
1,2,4-Trichlorobenzene		NC	Carbazole		NC
Naphthalene		NC	Phenol, 4-Nonyl-		NC
4-Chloroaniline		NC	2-Methylphenanthrene		NC
Hexachlorobutadiene		NC	1-Methylphenanthrene		NC
4-Chloro-3-Methylphenol		NC	Di-N-Butylphthalate		NC
2-Methylnaphthalene		NC	Fluoranthene		NC
1-Methylnaphthalene		NC	Benzidine		NC
Hexachlorocyclopentadiene		NC	Pyrene		NC
2,4,6-Trichlorophenol		NC	Retene		NC
2,4,5-Trichlorophenol		NC	Butylbenzylphthalate		NC
1,1'-Biphenyl		NC	Benzo(a)anthracene		NC
2-Chloronaphthalene		NC	3,3'-Dichlorobenzidine		NC
2,6-Dimethylnaphthalene		NC	Chrysene		NC
2-Nitroaniline		NC	**Bis(2-Ethylhexyl) Phthalate**	**20000**	**J**
Dimethylphthalate		NC	Di-N-Octyl Phthalate		NC
2,6-Dinitrotoluene		NC	Benzo(b)fluoranthene		NC

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178081 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene		NC
Benzo[e]pyrene		NC
Benzo(a)pyrene		NC
Perylene		NC
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene		NC
Dibenzo(a,h)anthracene		NC
Benzo(ghi)perylene		NC

Surrogate Recoveries

2-Fluorophenol	**138**	**%**
D5-Phenol	**149**	**%**
D4-2-Chlorophenol	**119**	**%**
1,2-Dichlorobenzene-D4	**90**	**%**
D5-Nitrobenzene	**106**	**%**
2-Fluorobiphenyl	**108**	**%**
D10-Pyrene	**137**	**%**
D14-Terphenyl	**129**	**%**

Authorized By: _____ Release Date: 7/6/98

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178082 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2D **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	242	U	**Acenaphthylene**	**76**	**J**
N-Nitrosodimethylamine	242	U	3-Nitroaniline	605	UJ
Aniline	121	UJ	**Acenaphthene**	**174**	
Phenol	**892**		2,4-Dinitrophenol	9680	U
Bis(2-Chloroethyl)Ether	242	U	4-Nitrophenol	605	U
2-Chlorophenol	242	U	**1,6,7-Trimethylnaphthalene**	**136**	
1,3-Dichlorobenzene	242	U	**Dibenzofuran**	**141**	
1,4-Dichlorobenzene	242	U	2,4-Dinitrotoluene	605	U
1,2-Dichlorobenzene	242	U	Diethylphthalate	242	U
Benzyl Alcohol	121	U	**Fluorene**	**267**	
2-Methylphenol	**36**	**J**	4-Chlorophenyl-Phenylether	242	U
2,2'-Oxybis[1-chloropropane]	121	U	4-Nitroaniline	605	U
N-Nitroso-Di-N-Propylamine	242	U	4,6-Dinitro-2-Methylphenol	2420	U
4-Methylphenol	**7810**		N-Nitrosodiphenylamine	242	U
Hexachloroethane	242	U	1,2-Diphenylhydrazine	121	U
Nitrobenzene	242	U	4-Bromophenyl-Phenylether	242	U
Isophorone	242	U	Hexachlorobenzene	242	U
2-Nitrophenol	605	U	**Pentachlorophenol**	**904**	
2,4-Dimethylphenol	242	U	**Dibenzothiophene**	**220**	
Bis(2-Chloroethoxy)Methane	242	U	**Phenanthrene**	**3980**	
Benzoic Acid	**4080**	**J**	**Anthracene**	**667**	
2,4-Dichlorophenol	242	U	**Caffeine**	**114**	**J**
1,2,4-Trichlorobenzene	242	U	**Carbazole**	**971**	
Naphthalene	**193**	**J**	Phenol, 4-Nonyl-	242	U
4-Chloroaniline	121	UJ	**2-Methylphenanthrene**	**600**	
Hexachlorobutadiene	242	U	**1-Methylphenanthrene**	**356**	
4-Chloro-3-Methylphenol	242	U	Di-N-Butylphthalate	6060	U
2-Methylnaphthalene	**274**		**Fluoranthene**	**6170**	
1-Methylnaphthalene	**199**	**J**	Benzidine	1210	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**5160**	
2,4,6-Trichlorophenol	242	U	**Retene**	**214**	**J**
2,4,5-Trichlorophenol	242	U	**Butylbenzylphthalate**	**911**	
1,1'-Biphenyl	121	U	**Benzo(a)anthracene**	**2000**	
2-Chloronaphthalene	121	U	3,3'-Dichlorobenzidine	242	U
2,6-Dimethylnaphthalene	**211**		**Chrysene**	**3200**	
2-Nitroaniline	605	U	**Bis(2-Ethylhexyl) Phthalate**	**15100**	**E**
Dimethylphthalate	**190**	**J**	Di-N-Octyl Phthalate	605	U
2,6-Dinitrotoluene	605	U	**Benzo(b)fluoranthene**	**3620**	

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178082 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2D **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	**1350**	
Benzo[e]pyrene	**1620**	
Benzo(a)pyrene	**2360**	
Perylene	**675**	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	**1920**	
Dibenzo(a,h)anthracene	**423**	
Benzo(ghi)perylene	**1110**	**J**

Surrogate Recoveries

2-Fluorophenol	**146**	**%**
D5-Phenol	**148**	**%**
D4-2-Chlorophenol	**127**	**%**
1,2-Dichlorobenzene-D4	**95**	**%**
D5-Nitrobenzene	**112**	**%**
2-Fluorobiphenyl	**111**	**%**
D10-Pyrene	**105**	**%**
D14-Terphenyl	**111**	**%**

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178082 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2D **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NC	Acenaphthylene		NC
N-Nitrosodimethylamine		NC	3-Nitroaniline		NC
Aniline		NC	Acenaphthene		NC
Phenol		NC	2,4-Dinitrophenol		NC
Bis(2-Chloroethyl)Ether		NC	4-Nitrophenol		NC
2-Chlorophenol		NC	1,6,7-Trimethylnaphthalene		NC
1,3-Dichlorobenzene		NC	Dibenzofuran		NC
1,4-Dichlorobenzene		NC	2,4-Dinitrotoluene		NC
1,2-Dichlorobenzene		NC	Diethylphthalate		NC
Benzyl Alcohol		NC	Fluorene		NC
2-Methylphenol		NC	4-Chlorophenyl-Phenylether		NC
2,2'-Oxybis[1-chloropropane]		NC	4-Nitroaniline		NC
N-Nitroso-Di-N-Propylamine		NC	4,6-Dinitro-2-Methylphenol		NC
4-Methylphenol		NC	N-Nitrosodiphenylamine		NC
Hexachloroethane		NC	1,2-Diphenylhydrazine		NC
Nitrobenzene		NC	4-Bromophenyl-Phenylether		NC
Isophorone		NC	Hexachlorobenzene		NC
2-Nitrophenol		NC	Pentachlorophenol		NC
2,4-Dimethylphenol		NC	Dibenzothiophene		NC
Bis(2-Chloroethoxy)Methane		NC	Phenanthrene		NC
Benzoic Acid		NC	Anthracene		NC
2,4-Dichlorophenol		NC	Caffeine		NC
1,2,4-Trichlorobenzene		NC	Carbazole		NC
Naphthalene		NC	Phenol, 4-Nonyl-		NC
4-Chloroaniline		NC	2-Methylphenanthrene		NC
Hexachlorobutadiene		NC	1-Methylphenanthrene		NC
4-Chloro-3-Methylphenol		NC	Di-N-Butylphthalate		NC
2-Methylnaphthalene		NC	Fluoranthene		NC
1-Methylnaphthalene		NC	Benzidine		NC
Hexachlorocyclopentadiene		NC	Pyrene		NC
2,4,6-Trichlorophenol		NC	Retene		NC
2,4,5-Trichlorophenol		NC	Butylbenzylphthalate		NC
1,1'-Biphenyl		NC	Benzo(a)anthracene		NC
2-Chloronaphthalene		NC	3,3'-Dichlorobenzidine		NC
2,6-Dimethylnaphthalene		NC	Chrysene		NC
2-Nitroaniline		NC	**Bis(2-Ethylhexyl) Phthalate**	**14700**	
Dimethylphthalate		NC	Di-N-Octyl Phthalate		NC
2,6-Dinitrotoluene		NC	Benzo(b)fluoranthene		NC

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178082 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-2D **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene		NC
Benzo[e]pyrene		NC
Benzo(a)pyrene		NC
Perylene		NC
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene		NC
Dibenzo(a,h)anthracene		NC
Benzo(ghi)perylene		NC

Surrogate Recoveries

2-Fluorophenol	**150**	**%**
D5-Phenol	**154**	**%**
D4-2-Chlorophenol	**122**	**%**
1,2-Dichlorobenzene-D4	**109**	**%**
D5-Nitrobenzene	**116**	**%**
2-Fluorobiphenyl	**112**	**%**
D10-Pyrene	**135**	**%**
D14-Terphenyl	**135**	**%**

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178083 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-3 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	318	U	**Acenaphthylene**	**141**	**J**
N-Nitrosodimethylamine	318	U	3-Nitroaniline	795	UJ
Aniline	159	UJ	**Acenaphthene**	**612**	
Phenol	**704**		2,4-Dinitrophenol	12700	U
Bis(2-Chloroethyl)Ether	318	U	4-Nitrophenol	795	U
2-Chlorophenol	318	U	**1,6,7-Trimethylnaphthalene**	**91**	**J**
1,3-Dichlorobenzene	318	U	**Dibenzofuran**	**552**	
1,4-Dichlorobenzene	318	U	2,4-Dinitrotoluene	795	U
1,2-Dichlorobenzene	318	U	Diethylphthalate	318	U
Benzyl Alcohol	159	U	**Fluorene**	**1020**	
2-Methylphenol	**49**	**J**	4-Chlorophenyl-Phenylether	318	U
2,2'-Oxybis[1-chloropropane]	159	U	4-Nitroaniline	795	U
N-Nitroso-Di-N-Propylamine	318	U	4,6-Dinitro-2-Methylphenol	3180	U
4-Methylphenol	**4720**		N-Nitrosodiphenylamine	318	U
Hexachloroethane	318	U	1,2-Diphenylhydrazine	159	U
Nitrobenzene	318	U	4-Bromophenyl-Phenylether	318	U
Isophorone	318	U	Hexachlorobenzene	318	U
2-Nitrophenol	795	U	**Pentachlorophenol**	**549**	**J**
2,4-Dimethylphenol	318	U	**Dibenzothiophene**	**974**	
Bis(2-Chloroethoxy)Methane	318	U	**Phenanthrene**	**19200**	**E**
Benzoic Acid	**4840**	**J**	**Anthracene**	**3030**	
2,4-Dichlorophenol	318	U	**Caffeine**	**227**	
1,2,4-Trichlorobenzene	318	U	**Carbazole**	**4210**	
Naphthalene	**353**		Phenol, 4-Nonyl-	318	U
4-Chloroaniline	159	UJ	**2-Methylphenanthrene**	**1600**	
Hexachlorobutadiene	318	U	**1-Methylphenanthrene**	**991**	
4-Chloro-3-Methylphenol	318	U	Di-N-Butylphthalate	1070	U
2-Methylnaphthalene	**252**		**Fluoranthene**	**29200**	**E**
1-Methylnaphthalene	**155**	**J**	Benzidine	1590	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**22000**	**E**
2,4,6-Trichlorophenol	318	U	**Retene**	**356**	
2,4,5-Trichlorophenol	318	U	**Butylbenzylphthalate**	**976**	
1,1'-Biphenyl	**84**	**J**	**Benzo(a)anthracene**	**9500**	
2-Chloronaphthalene	159	U	3,3'-Dichlorobenzidine	318	U
2,6-Dimethylnaphthalene	**164**		**Chrysene**	**11700**	
2-Nitroaniline	795	U	**Bis(2-Ethylhexyl) Phthalate**	**33800**	**E**
Dimethylphthalate	318	U	**Di-N-Octyl Phthalate**	**1070**	
2,6-Dinitrotoluene	795	U	**Benzo(b)fluoranthene**	**15000**	**E**

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178083 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-3 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	6560	
Benzo[e]pyrene	6850	
Benzo(a)pyrene	10700	
Perylene	2890	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	7880	
Dibenzo(a,h)anthracene	2130	
Benzo(ghi)perylene	4980	

Surrogate Recoveries

2-Fluorophenol	116	%
D5-Phenol	128	%
D4-2-Chlorophenol	105	%
1,2-Dichlorobenzene-D4	79	%
D5-Nitrobenzene	100	%
2-Fluorobiphenyl	93	%
D10-Pyrene	91	%
D14-Terphenyl	94	%

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178083 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-3 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NC	Acenaphthylene		NC
N-Nitrosodimethylamine		NC	3-Nitroaniline		NC
Aniline		NC	Acenaphthene		NC
Phenol		NC	2,4-Dinitrophenol		NC
Bis(2-Chloroethyl)Ether		NC	4-Nitrophenol		NC
2-Chlorophenol		NC	1,6,7-Trimethylnaphthalene		NC
1,3-Dichlorobenzene		NC	Dibenzofuran		NC
1,4-Dichlorobenzene		NC	2,4-Dinitrotoluene		NC
1,2-Dichlorobenzene		NC	Diethylphthalate		NC
Benzyl Alcohol		NC	Fluorene		NC
2-Methylphenol		NC	4-Chlorophenyl-Phenylether		NC
2,2'-Oxybis[1-chloropropane]		NC	4-Nitroaniline		NC
N-Nitroso-Di-N-Propylamine		NC	4,6-Dinitro-2-Methylphenol		NC
4-Methylphenol		NC	N-Nitrosodiphenylamine		NC
Hexachloroethane		NC	1,2-Diphenylhydrazine		NC
Nitrobenzene		NC	4-Bromophenyl-Phenylether		NC
Isophorone		NC	Hexachlorobenzene		NC
2-Nitrophenol		NC	Pentachlorophenol		NC
2,4-Dimethylphenol		NC	Dibenzothiophene		NC
Bis(2-Chloroethoxy)Methane		NC	**Phenanthrene**	**22300**	
Benzoic Acid		NC	Anthracene		NC
2,4-Dichlorophenol		NC	Caffeine		NC
1,2,4-Trichlorobenzene		NC	Carbazole		NC
Naphthalene		NC	Phenol, 4-Nonyl-		NC
4-Chloroaniline		NC	2-Methylphenanthrene		NC
Hexachlorobutadiene		NC	1-Methylphenanthrene		NC
4-Chloro-3-Methylphenol		NC	Di-N-Butylphthalate		NC
2-Methylnaphthalene		NC	**Fluoranthene**	**32600**	
1-Methylnaphthalene		NC	Benzidine		NC
Hexachlorocyclopentadiene		NC	**Pyrene**	**29500**	**J**
2,4,6-Trichlorophenol		NC	Retene		NC
2,4,5-Trichlorophenol		NC	Butylbenzylphthalate		NC
1,1'-Biphenyl		NC	Benzo(a)anthracene		NC
2-Chloronaphthalene		NC	3,3'-Dichlorobenzidine		NC
2,6-Dimethylnaphthalene		NC	Chrysene		NC
2-Nitroaniline		NC	**Bis(2-Ethylhexyl) Phthalate**	**39600**	
Dimethylphthalate		NC	Di-N-Octyl Phthalate		NC
2,6-Dinitrotoluene		NC	**Benzo(b)fluoranthene**	**16000**	

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Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178083 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-3 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene		NC
Benzo[e]pyrene		NC
Benzo(a)pyrene		NC
Perylene		NC
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene		NC
Dibenzo(a,h)anthracene		NC
Benzo(ghi)perylene		NC

Surrogate Recoveries

2-Fluorophenol	**136**	**%**
D5-Phenol	**146**	**%**
D4-2-Chlorophenol	**124**	**%**
1,2-Dichlorobenzene-D4	**94**	**%**
D5-Nitrobenzene	**121**	**%**
2-Fluorobiphenyl	**109**	**%**
D10-Pyrene	**131**	**%**
D14-Terphenyl	**115**	**%**

Authorized By: _____ Release Date: 7/6/98

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	52	U	**Acenaphthylene**	**7.4**	**J**
N-Nitrosodimethylamine	52	U	3-Nitroaniline	131	UJ
Aniline	26	UJ	**Acenaphthene**	**17**	**J**
Phenol	52	U	2,4-Dinitrophenol	2090	U
Bis(2-Chloroethyl)Ether	52	U	4-Nitrophenol	131	U
2-Chlorophenol	52	U	**1,6,7-Trimethylnaphthalene**	**7.5**	**J**
1,3-Dichlorobenzene	52	U	**Dibenzofuran**	**15**	**J**
1,4-Dichlorobenzene	52	U	2,4-Dinitrotoluene	131	U
1,2-Dichlorobenzene	52	U	Diethylphthalate	52	U
Benzyl Alcohol	**19**	**J**	**Fluorene**	**30**	
2-Methylphenol	52	U	4-Chlorophenyl-Phenylether	52	U
2,2'-Oxybis[1-chloropropane]	26	U	4-Nitroaniline	131	U
N-Nitroso-Di-N-Propylamine	52	U	4,6-Dinitro-2-Methylphenol	523	U
4-Methylphenol	**81**		N-Nitrosodiphenylamine	52	U
Hexachloroethane	52	U	1,2-Diphenylhydrazine	26	U
Nitrobenzene	52	U	4-Bromophenyl-Phenylether	52	U
Isophorone	52	U	Hexachlorobenzene	52	U
2-Nitrophenol	131	U	Pentachlorophenol	131	U
2,4-Dimethylphenol	52	U	**Dibenzothiophene**	**22**	**J**
Bis(2-Chloroethoxy)Methane	52	U	**Phenanthrene**	**470**	
Benzoic Acid	**699**	**J**	**Anthracene**	**78**	
2,4-Dichlorophenol	52	U	**Caffeine**	**84**	
1,2,4-Trichlorobenzene	52	U	**Carbazole**	**111**	
Naphthalene	**12**	**J**	Phenol, 4-Nonyl-	52	U
4-Chloroaniline	26	UJ	**2-Methylphenanthrene**	**50**	
Hexachlorobutadiene	52	U	**1-Methylphenanthrene**	**42**	
4-Chloro-3-Methylphenol	52	U	**Di-N-Butylphthalate**	**5300**	**E**
2-Methylnaphthalene	**15**	**J**	**Fluoranthene**	**824**	
1-Methylnaphthalene	**8.9**	**J**	Benzidine	262	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**679**	
2,4,6-Trichlorophenol	52	U	**Retene**	**25**	**J**
2,4,5-Trichlorophenol	52	U	Butylbenzylphthalate	52	U
1,1'-Biphenyl	26	U	**Benzo(a)anthracene**	**252**	
2-Chloronaphthalene	26	U	3,3'-Dichlorobenzidine	52	U
2,6-Dimethylnaphthalene	**7.9**	**J**	**Chrysene**	**400**	
2-Nitroaniline	131	U	**Bis(2-Ethylhexyl) Phthalate**	**927**	
Dimethylphthalate	52	U	Di-N-Octyl Phthalate	131	U
2,6-Dinitrotoluene	131	U	**Benzo(b)fluoranthene**	**513**	

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	**195**	
Benzo[e]pyrene	**255**	
Benzo(a)pyrene	**322**	
Perylene	**107**	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	**282**	
Dibenzo(a,h)anthracene	**71**	
Benzo(ghi)perylene	**262**	

Surrogate Recoveries

2-Fluorophenol	**85**	**%**
D5-Phenol	**97**	**%**
D4-2-Chlorophenol	**78**	**%**
1,2-Dichlorobenzene-D4	**59**	**%**
D5-Nitrobenzene	**82**	**%**
2-Fluorobiphenyl	**71**	**%**
D10-Pyrene	**77**	**%**
D14-Terphenyl	**79**	**%**

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 (Matrix Spike - LMX1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/04/98 **Units:** % Recovery

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NAF	Acenaphthylene	96	
N-Nitrosodimethylamine	63		3-Nitroaniline	43	
Aniline	17		Acenaphthene	89	
Phenol	81		2,4-Dinitrophenol	168	
Bis(2-Chloroethyl)Ether	64		4-Nitrophenol	92	
2-Chlorophenol	95		1,6,7-Trimethylnaphthalene		NAF
1,3-Dichlorobenzene	78		Dibenzofuran	87	
1,4-Dichlorobenzene	80		2,4-Dinitrotoluene	102	
1,2-Dichlorobenzene	81		Diethylphthalate	102	
Benzyl Alcohol	80		Fluorene	98	
2-Methylphenol	96		4-Chlorophenyl-Phenylether	98	
2,2'-Oxybis[1-chloropropane]	54		4-Nitroaniline	57	
N-Nitroso-Di-N-Propylamine	67		4,6-Dinitro-2-Methylphenol	138	
4-Methylphenol	101		N-Nitrosodiphenylamine	94	
Hexachloroethane	85		1,2-Diphenylhydrazine	90	
Nitrobenzene	89		4-Bromophenyl-Phenylether	115	
Isophorone	85		Hexachlorobenzene	117	
2-Nitrophenol	106		Pentachlorophenol	101	
2,4-Dimethylphenol	96		Dibenzothiophene		NAF
Bis(2-Chloroethoxy)Methane	98		Phenanthrene	91	
Benzoic Acid	126		Anthracene	107	
2,4-Dichlorophenol	104		Caffeine		NAF
1,2,4-Trichlorobenzene	98		Carbazole		NAF
Naphthalene	88		Phenol, 4-Nonyl-		NAF
4-Chloroaniline	24		2-Methylphenanthrene		NAF
Hexachlorobutadiene	99		1-Methylphenanthrene		NAF
4-Chloro-3-Methylphenol	116		Di-N-Butylphthalate	129	
2-Methylnaphthalene	80		Fluoranthene	91	
1-Methylnaphthalene		NAF	Benzidine		NAF
Hexachlorocyclopentadiene	8		Pyrene	78	
2,4,6-Trichlorophenol	104		Retene		NAF
2,4,5-Trichlorophenol	107		Butylbenzylphthalate	96	
1,1'-Biphenyl		NAF	Benzo(a)anthracene	85	
2-Chloronaphthalene	87		3,3'-Dichlorobenzidine		NAF
2,6-Dimethylnaphthalene		NAF	Chrysene	89	
2-Nitroaniline	71		Bis(2-Ethylhexyl) Phthalate	104	
Dimethylphthalate	94		Di-N-Octyl Phthalate	99	
2,6-Dinitrotoluene	101		Benzo(b)fluoranthene	83	

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 (Matrix Spike - LMX1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/04/98 **Units:** % Recovery

Analyte	Result	Qualifier
Benzo(k)fluoranthene	**101**	
Benzo[e]pyrene		NAF
Benzo(a)pyrene	**104**	
Perylene		NAF
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	**100**	
Dibenzo(a,h)anthracene	**101**	
Benzo(ghi)perylene	**91**	

Surrogate Recoveries

2-Fluorophenol	**99**	**%**
D5-Phenol	**94**	**%**
D4-2-Chlorophenol	**87**	**%**
1,2-Dichlorobenzene-D4	**72**	**%**
D5-Nitrobenzene	**85**	**%**
2-Fluorobiphenyl	**82**	**%**
D10-Pyrene	**89**	**%**
D14-Terphenyl	**91**	**%**

Authorized By: _____ Release Date: 7/6/98

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 (Duplicate - LDP1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/03/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	226	U	Acenaphthylene	226	U
N-Nitrosodimethylamine	226	U	3-Nitroaniline	566	UJ
Aniline	113	U	**Acenaphthene**	**57**	**J**
Phenol	**81**	**J**	2,4-Dinitrophenol	9060	U
Bis(2-Chloroethyl)Ether	226	U	4-Nitrophenol	566	U
2-Chlorophenol	226	U	**1,6,7-Trimethylnaphthalene**	**12**	**J**
1,3-Dichlorobenzene	226	U	**Dibenzofuran**	**37**	**J**
1,4-Dichlorobenzene	226	U	2,4-Dinitrotoluene	566	U
1,2-Dichlorobenzene	226	U	Diethylphthalate	226	U
Benzyl Alcohol	113	U	**Fluorene**	**87**	**J**
2-Methylphenol	226	U	4-Chlorophenyl-Phenylether	226	U
2,2'-Oxybis[1-chloropropane]	113	U	4-Nitroaniline	566	U
N-Nitroso-Di-N-Propylamine	226	U	4,6-Dinitro-2-Methylphenol	2260	U
4-Methylphenol	**83**	**J**	N-Nitrosodiphenylamine	226	U
Hexachloroethane	226	U	1,2-Diphenylhydrazine	113	U
Nitrobenzene	226	U	4-Bromophenyl-Phenylether	226	U
Isophorone	226	U	Hexachlorobenzene	226	U
2-Nitrophenol	566	U	Pentachlorophenol	566	U
2,4-Dimethylphenol	226	U	**Dibenzothiophene**	**74**	**J**
Bis(2-Chloroethoxy)Methane	226	U	**Phenanthrene**	**1110**	
Benzoic Acid	2550	U	**Anthracene**	**184**	**J**
2,4-Dichlorophenol	226	U	**Caffeine**	**82**	**J**
1,2,4-Trichlorobenzene	226	U	**Carbazole**	**240**	
Naphthalene	226	U	Phenol, 4-Nonyl-	226	U
4-Chloroaniline	113	UJ	**2-Methylphenanthrene**	**117**	
Hexachlorobutadiene	226	U	**1-Methylphenanthrene**	**72**	**J**
4-Chloro-3-Methylphenol	226	U	Di-N-Butylphthalate	5890	U
2-Methylnaphthalene	**13**	**J**	**Fluoranthene**	**1900**	
1-Methylnaphthalene	**10**	**J**	Benzidine	1130	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**1170**	
2,4,6-Trichlorophenol	226	U	Retene	226	U
2,4,5-Trichlorophenol	226	U	Butylbenzylphthalate	226	U
1,1'-Biphenyl	113	U	**Benzo(a)anthracene**	**504**	
2-Chloronaphthalene	113	U	3,3'-Dichlorobenzidine	226	U
2,6-Dimethylnaphthalene	**12**	**J**	**Chrysene**	**669**	
2-Nitroaniline	566	U	Bis(2-Ethylhexyl) Phthalate	914	U
Dimethylphthalate	226	U	Di-N-Octyl Phthalate	566	U
2,6-Dinitrotoluene	566	U	**Benzo(b)fluoranthene**	**902**	

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 (Duplicate - LDP1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/03/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	344	
Benzo[e]pyrene	421	
Benzo(a)pyrene	635	
Perylene	216	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	506	J
Dibenzo(a,h)anthracene	147	J
Benzo(ghi)perylene	481	J

Surrogate Recoveries

2-Fluorophenol	96	%
D5-Phenol	95	%
D4-2-Chlorophenol	88	%
1,2-Dichlorobenzene-D4	60	%
D5-Nitrobenzene	76	%
2-Fluorobiphenyl	78	%
D10-Pyrene	86	%
D14-Terphenyl	85	%

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NC	Acenaphthylene		NC
N-Nitrosodimethylamine		NC	3-Nitroaniline		NC
Aniline		NC	Acenaphthene		NC
Phenol		NC	2,4-Dinitrophenol		NC
Bis(2-Chloroethyl)Ether		NC	4-Nitrophenol		NC
2-Chlorophenol		NC	1,6,7-Trimethylnaphthalene		NC
1,3-Dichlorobenzene		NC	Dibenzofuran		NC
1,4-Dichlorobenzene		NC	2,4-Dinitrotoluene		NC
1,2-Dichlorobenzene		NC	Diethylphthalate		NC
Benzyl Alcohol		NC	Fluorene		NC
2-Methylphenol		NC	4-Chlorophenyl-Phenylether		NC
2,2'-Oxybis[1-chloropropane]		NC	4-Nitroaniline		NC
N-Nitroso-Di-N-Propylamine		NC	4,6-Dinitro-2-Methylphenol		NC
4-Methylphenol		NC	N-Nitrosodiphenylamine		NC
Hexachloroethane		NC	1,2-Diphenylhydrazine		NC
Nitrobenzene		NC	4-Bromophenyl-Phenylether		NC
Isophorone		NC	Hexachlorobenzene		NC
2-Nitrophenol		NC	Pentachlorophenol		NC
2,4-Dimethylphenol		NC	Dibenzothiophene		NC
Bis(2-Chloroethoxy)Methane		NC	Phenanthrene		NC
Benzoic Acid		NC	Anthracene		NC
2,4-Dichlorophenol		NC	Caffeine		NC
1,2,4-Trichlorobenzene		NC	Carbazole		NC
Naphthalene		NC	Phenol, 4-Nonyl-		NC
4-Chloroaniline		NC	2-Methylphenanthrene		NC
Hexachlorobutadiene		NC	1-Methylphenanthrene		NC
4-Chloro-3-Methylphenol		NC	**Di-N-Butylphthalate**	**7080**	
2-Methylnaphthalene		NC	Fluoranthene		NC
1-Methylnaphthalene		NC	Benzidine		NC
Hexachlorocyclopentadiene		NC	Pyrene		NC
2,4,6-Trichlorophenol		NC	Retene		NC
2,4,5-Trichlorophenol		NC	Butylbenzylphthalate		NC
1,1'-Biphenyl		NC	Benzo(a)anthracene		NC
2-Chloronaphthalene		NC	3,3'-Dichlorobenzidine		NC
2,6-Dimethylnaphthalene		NC	Chrysene		NC
2-Nitroaniline		NC	Bis(2-Ethylhexyl) Phthalate		NC
Dimethylphthalate		NC	Di-N-Octyl Phthalate		NC
2,6-Dinitrotoluene		NC	Benzo(b)fluoranthene		NC

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178088 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-5 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene		NC
Benzo[e]pyrene		NC
Benzo(a)pyrene		NC
Perylene		NC
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene		NC
Dibenzo(a,h)anthracene		NC
Benzo(ghi)perylene		NC

Surrogate Recoveries

2-Fluorophenol	**111**	**%**
D5-Phenol	**117**	**%**
D4-2-Chlorophenol	**99**	**%**
1,2-Dichlorobenzene-D4	**77**	**%**
D5-Nitrobenzene	**102**	**%**
2-Fluorobiphenyl	**91**	**%**
D10-Pyrene	**109**	**%**
D14-Terphenyl	**108**	**%**

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Analysis Report for

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Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178089 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-6 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	2520	U	**Acenaphthylene**	**399**	**J**
N-Nitrosodimethylamine	2520	U	3-Nitroaniline	6300	UJ
Aniline	1260	UJ	**Acenaphthene**	**495**	**J**
Phenol	2610	U	2,4-Dinitrophenol	101000	U
Bis(2-Chloroethyl)Ether	2520	U	4-Nitrophenol	6300	U
2-Chlorophenol	2520	U	**1,6,7-Trimethylnaphthalene**	**348**	**J**
1,3-Dichlorobenzene	2520	U	**Dibenzofuran**	**451**	**J**
1,4-Dichlorobenzene	2520	U	2,4-Dinitrotoluene	6300	U
1,2-Dichlorobenzene	2520	U	Diethylphthalate	2520	U
Benzyl Alcohol	**2950**		**Fluorene**	**912**	**J**
2-Methylphenol	**356**	**J**	4-Chlorophenyl-Phenylether	2520	U
2,2'-Oxybis[1-chloropropane]	1260	U	4-Nitroaniline	6300	U
N-Nitroso-Di-N-Propylamine	2520	U	4,6-Dinitro-2-Methylphenol	25200	U
4-Methylphenol	**3610**		**N-Nitrosodiphenylamine**	**729**	**J**
Hexachloroethane	2520	U	1,2-Diphenylhydrazine	1260	U
Nitrobenzene	2520	U	4-Bromophenyl-Phenylether	2520	U
Isophorone	2520	U	Hexachlorobenzene	2520	U
2-Nitrophenol	6300	U	**Pentachlorophenol**	**4060**	**J**
2,4-Dimethylphenol	2520	U	**Dibenzothiophene**	**942**	**J**
Bis(2-Chloroethoxy)Methane	2520	U	**Phenanthrene**	**11000**	
Benzoic Acid	32000	U	**Anthracene**	**1760**	**J**
2,4-Dichlorophenol	2520	U	**Caffeine**	**634**	**J**
1,2,4-Trichlorobenzene	2520	U	**Carbazole**	**2050**	**J**
Naphthalene	**1030**	**J**	Phenol, 4-Nonyl-	2520	U
4-Chloroaniline	1260	UJ	**2-Methylphenanthrene**	**1950**	
Hexachlorobutadiene	2520	U	**1-Methylphenanthrene**	**1170**	**J**
4-Chloro-3-Methylphenol	2520	U	Di-N-Butylphthalate	6870	U
2-Methylnaphthalene	**909**	**J**	**Fluoranthene**	**15200**	
1-Methylnaphthalene	**464**	**J**	Benzidine	12600	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**14500**	
2,4,6-Trichlorophenol	2520	U	**Retene**	**1500**	**J**
2,4,5-Trichlorophenol	2520	U	**Butylbenzylphthalate**	**8840**	
1,1'-Biphenyl	1260	U	**Benzo(a)anthracene**	**4610**	
2-Chloronaphthalene	1260	U	3,3'-Dichlorobenzidine	2520	U
2,6-Dimethylnaphthalene	**594**	**J**	**Chrysene**	**9600**	
2-Nitroaniline	6300	U	**Bis(2-Ethylhexyl) Phthalate**	**95500**	
Dimethylphthalate	2520	U	Di-N-Octyl Phthalate	6300	U
2,6-Dinitrotoluene	6300	U	**Benzo(b)fluoranthene**	**10300**	

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178089 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-6 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	**3640**	
Benzo[e]pyrene	**5500**	
Benzo(a)pyrene	**6000**	
Perylene	**1920**	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	**5740**	**J**
Dibenzo(a,h)anthracene	2520	U
Benzo(ghi)perylene	**4960**	**J**

Surrogate Recoveries

2-Fluorophenol	**132**	**%**
D5-Phenol	**142**	**%**
D4-2-Chlorophenol	**118**	**%**
1,2-Dichlorobenzene-D4	**80**	**%**
D5-Nitrobenzene	**102**	**%**
2-Fluorobiphenyl	**110**	**%**
D10-Pyrene	**116**	**%**
D14-Terphenyl	**115**	**%**

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-8 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	179	U	**Acenaphthylene**	**185**	
N-Nitrosodimethylamine	179	U	3-Nitroaniline	447	UJ
Aniline	89	UJ	**Acenaphthene**	**138**	
Phenol	**877**		2,4-Dinitrophenol	7150	U
Bis(2-Chloroethyl)Ether	179	U	4-Nitrophenol	447	U
2-Chlorophenol	179	U	**1,6,7-Trimethylnaphthalene**	**153**	
1,3-Dichlorobenzene	179	U	**Dibenzofuran**	**196**	
1,4-Dichlorobenzene	179	U	2,4-Dinitrotoluene	447	U
1,2-Dichlorobenzene	179	U	Diethylphthalate	447	U
Benzyl Alcohol	**1300**		**Fluorene**	**330**	
2-Methylphenol	**90**	J	4-Chlorophenyl-Phenylether	179	U
2,2'-Oxybis[1-chloropropane]	89	U	4-Nitroaniline	447	U
N-Nitroso-Di-N-Propylamine	179	U	4,6-Dinitro-2-Methylphenol	1790	U
4-Methylphenol	**797**		N-Nitrosodiphenylamine	179	U
Hexachloroethane	179	U	1,2-Diphenylhydrazine	89	U
Nitrobenzene	179	U	4-Bromophenyl-Phenylether	179	U
Isophorone	179	U	Hexachlorobenzene	179	U
2-Nitrophenol	447	U	**Pentachlorophenol**	**632**	
2,4-Dimethylphenol	179	U	**Dibenzothiophene**	**271**	
Bis(2-Chloroethoxy)Methane	179	U	**Phenanthrene**	**3790**	
Benzoic Acid	**7770**	E	**Anthracene**	**738**	
2,4-Dichlorophenol	179	U	**Caffeine**	**355**	
1,2,4-Trichlorobenzene	179	U	**Carbazole**	**576**	
Naphthalene	**400**		Phenol, 4-Nonyl-	179	U
4-Chloroaniline	89	UJ	**2-Methylphenanthrene**	**703**	
Hexachlorobutadiene	179	U	**1-Methylphenanthrene**	**484**	
4-Chloro-3-Methylphenol	179	U	Di-N-Butylphthalate	4420	U
2-Methylnaphthalene	**483**		**Fluoranthene**	**4000**	
1-Methylnaphthalene	**316**		Benzidine	894	UJ
Hexachlorocyclopentadiene		REJ	**Pyrene**	**3590**	
2,4,6-Trichlorophenol	179	U	**Retene**	**698**	
2,4,5-Trichlorophenol	179	U	**Butylbenzylphthalate**	**3410**	
1,1'-Biphenyl	**113**		**Benzo(a)anthracene**	**794**	
2-Chloronaphthalene	89	U	3,3'-Dichlorobenzidine	179	U
2,6-Dimethylnaphthalene	**306**		**Chrysene**	**1890**	
2-Nitroaniline	447	U	**Bis(2-Ethylhexyl) Phthalate**	**17500**	E
Dimethylphthalate	**12600**	E	Di-N-Octyl Phthalate	447	U
2,6-Dinitrotoluene	447	U	**Benzo(b)fluoranthene**	**895**	

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-8 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	1160	
Benzo[e]pyrene	1040	
Benzo(a)pyrene	721	
Perylene	230	
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	649	
Dibenzo(a,h)anthracene	175	J
Benzo(ghi)perylene	726	J

Surrogate Recoveries

2-Fluorophenol	101	%
D5-Phenol	105	%
D4-2-Chlorophenol	89	%
1,2-Dichlorobenzene-D4	69	%
D5-Nitrobenzene	89	%
2-Fluorobiphenyl	78	%
D10-Pyrene	79	%
D14-Terphenyl	82	%

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-8 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine		NC	Acenaphthylene		NC
N-Nitrosodimethylamine		NC	3-Nitroaniline		NC
Aniline		NC	Acenaphthene		NC
Phenol		NC	2,4-Dinitrophenol		NC
Bis(2-Chloroethyl)Ether		NC	4-Nitrophenol		NC
2-Chlorophenol		NC	1,6,7-Trimethylnaphthalene		NC
1,3-Dichlorobenzene		NC	Dibenzofuran		NC
1,4-Dichlorobenzene		NC	2,4-Dinitrotoluene		NC
1,2-Dichlorobenzene		NC	Diethylphthalate		NC
Benzyl Alcohol		NC	Fluorene		NC
2-Methylphenol		NC	4-Chlorophenyl-Phenylether		NC
2,2'-Oxybis[1-chloropropane]		NC	4-Nitroaniline		NC
N-Nitroso-Di-N-Propylamine		NC	4,6-Dinitro-2-Methylphenol		NC
4-Methylphenol		NC	N-Nitrosodiphenylamine		NC
Hexachloroethane		NC	1,2-Diphenylhydrazine		NC
Nitrobenzene		NC	4-Bromophenyl-Phenylether		NC
Isophorone		NC	Hexachlorobenzene		NC
2-Nitrophenol		NC	Pentachlorophenol		NC
2,4-Dimethylphenol		NC	Dibenzothiophene		NC
Bis(2-Chloroethoxy)Methane		NC	Phenanthrene		NC
Benzoic Acid	**9550**	**J**	Anthracene		NC
2,4-Dichlorophenol		NC	Caffeine		NC
1,2,4-Trichlorobenzene		NC	Carbazole		NC
Naphthalene		NC	Phenol, 4-Nonyl-		NC
4-Chloroaniline		NC	2-Methylphenanthrene		NC
Hexachlorobutadiene		NC	1-Methylphenanthrene		NC
4-Chloro-3-Methylphenol		NC	Di-N-Butylphthalate		NC
2-Methylnaphthalene		NC	Fluoranthene		NC
1-Methylnaphthalene		NC	Benzidine		NC
Hexachlorocyclopentadiene		NC	Pyrene		NC
2,4,6-Trichlorophenol		NC	Retene		NC
2,4,5-Trichlorophenol		NC	Butylbenzylphthalate		NC
1,1'-Biphenyl		NC	Benzo(a)anthracene		NC
2-Chloronaphthalene		NC	3,3'-Dichlorobenzidine		NC
2,6-Dimethylnaphthalene		NC	Chrysene		NC
2-Nitroaniline		NC	**Bis(2-Ethylhexyl) Phthalate**	**17200**	**E**
Dimethylphthalate	**13200**		Di-N-Octyl Phthalate		NC
2,6-Dinitrotoluene		NC	Benzo(b)fluoranthene		NC

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** SW8270
Field ID: FD-8 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 05/28/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene		NC
Benzo[e]pyrene		NC
Benzo(a)pyrene		NC
Perylene		NC
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene		NC
Dibenzo(a,h)anthracene		NC
Benzo(ghi)perylene		NC

Surrogate Recoveries

2-Fluorophenol	**103**	**%**
D5-Phenol	**108**	**%**
D4-2-Chlorophenol	**89**	**%**
1,2-Dichlorobenzene-D4	**69**	**%**
D5-Nitrobenzene	**94**	**%**
2-Fluorobiphenyl	**78**	**%**
D10-Pyrene	**86**	**%**
D14-Terphenyl	**85**	**%**

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8119A1 **Method:** SW8270

Date Prepared: 04/29/98 **Matrix:** Sediment/Soil

Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	166	U	Acenaphthylene	166	U
N-Nitrosodimethylamine	166	U	3-Nitroaniline	416	U
Aniline	83	U	Acenaphthene	83	U
Phenol	**67**	**J**	2,4-Dinitrophenol	6660	U
Bis(2-Chloroethyl)Ether	166	U	4-Nitrophenol	416	U
2-Chlorophenol	166	U	1,6,7-Trimethylnaphthalene	83	U
1,3-Dichlorobenzene	166	U	Dibenzofuran	83	U
1,4-Dichlorobenzene	166	U	2,4-Dinitrotoluene	416	U
1,2-Dichlorobenzene	166	U	Diethylphthalate	166	U
Benzyl Alcohol	83	U	Fluorene	83	U
2-Methylphenol	166	U	4-Chlorophenyl-Phenylether	166	U
2,2'-Oxybis[1-chloropropane]	83	U	4-Nitroaniline	416	U
N-Nitroso-Di-N-Propylamine	166	U	4,6-Dinitro-2-Methylphenol	1660	U
4-Methylphenol	166	U	N-Nitrosodiphenylamine	166	U
Hexachloroethane	166	U	1,2-Diphenylhydrazine	83	U
Nitrobenzene	166	U	4-Bromophenyl-Phenylether	166	U
Isophorone	166	U	Hexachlorobenzene	166	U
2-Nitrophenol	416	U	Pentachlorophenol	416	U
2,4-Dimethylphenol	166	U	Dibenzothiophene	83	U
Bis(2-Chloroethoxy)Methane	166	U	Phenanthrene	83	U
Benzoic Acid	**1850**	**J**	Anthracene	166	U
2,4-Dichlorophenol	166	U	Caffeine	83	U
1,2,4-Trichlorobenzene	166	U	Carbazole	166	U
Naphthalene	166	U	Phenol, 4-Nonyl-	166	U
4-Chloroaniline	83	U	2-Methylphenanthrene	83	U
Hexachlorobutadiene	166	U	1-Methylphenanthrene	83	U
4-Chloro-3-Methylphenol	166	U	**Di-N-Butylphthalate**	**332**	
2-Methylnaphthalene	83	U	Fluoranthene	83	U
1-Methylnaphthalene	166	U	Benzidine	832	UJ
Hexachlorocyclopentadiene	416	U	Pyrene	166	U
2,4,6-Trichlorophenol	166	U	Retene	166	U
2,4,5-Trichlorophenol	166	U	Butylbenzylphthalate	166	U
1,1'-Biphenyl	**7.1**	**J**	Benzo(a)anthracene	166	U
2-Chloronaphthalene	83	U	3,3'-Dichlorobenzidine	166	U
2,6-Dimethylnaphthalene	83	U	Chrysene	166	U
2-Nitroaniline	416	U	**Bis(2-Ethylhexyl) Phthalate**	**59**	**J**
Dimethylphthalate	166	U	Di-N-Octyl Phthalate	416	U
2,6-Dinitrotoluene	416	U	Benzo(b)fluoranthene	166	U

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8119A1 **Method:** SW8270

Date Prepared: 04/29/98 **Matrix:** Sediment/Soil

Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	166	U
Benzo[e]pyrene	83	U
Benzo(a)pyrene	83	U
Perylene	83	U
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	416	U
Dibenzo(a,h)anthracene	**54**	**J**
Benzo(ghi)perylene	832	U

Surrogate Recoveries

2-Fluorophenol	**108**	**%**
D5-Phenol	**118**	**%**
D4-2-Chlorophenol	**99**	**%**
1,2-Dichlorobenzene-D4	**91**	**%**
D5-Nitrobenzene	**108**	**%**
2-Fluorobiphenyl	**89**	**%**
D10-Pyrene	**95**	**%**
D14-Terphenyl	**93**	**%**

Authorized By: _____ Release Date: 7/16/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8119A2 **Method:** SW8270

Date Prepared: 04/29/98 **Matrix:** Sediment/Soil

Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	166	U	Acenaphthylene	166	U
N-Nitrosodimethylamine	166	U	3-Nitroaniline	416	U
Aniline	83	U	Acenaphthene	83	U
Phenol	**63**	**J**	2,4-Dinitrophenol	6660	U
Bis(2-Chloroethyl)Ether	166	U	4-Nitrophenol	416	U
2-Chlorophenol	166	U	1,6,7-Trimethylnaphthalene	83	U
1,3-Dichlorobenzene	166	U	Dibenzofuran	83	U
1,4-Dichlorobenzene	166	U	2,4-Dinitrotoluene	416	U
1,2-Dichlorobenzene	166	U	**Diethylphthalate**	**19**	**J**
Benzyl Alcohol	83	U	Fluorene	83	U
2-Methylphenol	166	U	4-Chlorophenyl-Phenylether	166	U
2,2'-Oxybis[1-chloropropane]	83	U	4-Nitroaniline	416	U
N-Nitroso-Di-N-Propylamine	166	U	4,6-Dinitro-2-Methylphenol	1660	U
4-Methylphenol	166	U	N-Nitrosodiphenylamine	166	U
Hexachloroethane	166	U	1,2-Diphenylhydrazine	83	U
Nitrobenzene	166	U	4-Bromophenyl-Phenylether	166	U
Isophorone	166	U	Hexachlorobenzene	166	U
2-Nitrophenol	416	U	Pentachlorophenol	416	U
2,4-Dimethylphenol	166	U	Dibenzothiophene	83	U
Bis(2-Chloroethoxy)Methane	166	U	Phenanthrene	83	U
Benzoic Acid	1660	U	Anthracene	166	U
2,4-Dichlorophenol	166	U	Caffeine	83	U
1,2,4-Trichlorobenzene	166	U	Carbazole	166	U
Naphthalene	166	U	Phenol, 4-Nonyl-	166	U
4-Chloroaniline	83	U	2-Methylphenanthrene	83	U
Hexachlorobutadiene	166	U	1-Methylphenanthrene	83	U
4-Chloro-3-Methylphenol	166	U	**Di-N-Butylphthalate**	**459**	
2-Methylnaphthalene	83	U	Fluoranthene	83	U
1-Methylnaphthalene	166	U	Benzidine	832	UJ
Hexachlorocyclopentadiene	416	U	Pyrene	166	U
2,4,6-Trichlorophenol	166	U	Retene	166	U
2,4,5-Trichlorophenol	166	U	Butylbenzylphthalate	166	U
1,1'-Biphenyl	**9**	**J**	Benzo(a)anthracene	166	U
2-Chloronaphthalene	83	U	3,3'-Dichlorobenzidine	166	U
2,6-Dimethylnaphthalene	83	U	Chrysene	166	U
2-Nitroaniline	416	U	**Bis(2-Ethylhexyl) Phthalate**	**251**	
Dimethylphthalate	166	U	Di-N-Octyl Phthalate	416	U
2,6-Dinitrotoluene	416	U	Benzo(b)fluoranthene	166	U

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Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8119A2 **Method:** SW8270

Project Officer: Dale Norton **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil

Date Analyzed: 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	166	U
Benzo[e]pyrene	83	U
Benzo(a)pyrene	83	U
Perylene	83	U
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	416	U
Dibenzo(a,h)anthracene	166	U
Benzo(ghi)perylene	832	U

Surrogate Recoveries

2-Fluorophenol	**108**	**%**
D5-Phenol	**119**	**%**
D4-2-Chlorophenol	**99**	**%**
1,2-Dichlorobenzene-D4	**90**	**%**
D5-Nitrobenzene	**105**	**%**
2-Fluorobiphenyl	**86**	**%**
D10-Pyrene	**93**	**%**
D14-Terphenyl	**93**	**%**

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8152A1 **Method:** SW8270

Date Prepared: 04/29/98 **Matrix:** Sediment/Soil

Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	83	U	Acenaphthylene	83	U
N-Nitrosodimethylamine	83	U	3-Nitroaniline	208	U
Aniline	42	U	Acenaphthene	42	U
Phenol	**64**	**J**	2,4-Dinitrophenol	3330	U
Bis(2-Chloroethyl)Ether	83	U	4-Nitrophenol	208	U
2-Chlorophenol	83	U	1,6,7-Trimethylnaphthalene	42	U
1,3-Dichlorobenzene	83	U	Dibenzofuran	42	U
1,4-Dichlorobenzene	83	U	2,4-Dinitrotoluene	208	U
1,2-Dichlorobenzene	83	U	**Diethylphthalate**	**7**	**J**
Benzyl Alcohol	42	U	Fluorene	42	U
2-Methylphenol	83	U	4-Chlorophenyl-Phenylether	83	U
2,2'-Oxybis[1-chloropropane]	42	U	4-Nitroaniline	208	U
N-Nitroso-Di-N-Propylamine	83	U	4,6-Dinitro-2-Methylphenol	832	U
4-Methylphenol	83	U	N-Nitrosodiphenylamine	83	U
Hexachloroethane	83	U	1,2-Diphenylhydrazine	42	U
Nitrobenzene	83	U	4-Bromophenyl-Phenylether	83	U
Isophorone	83	U	Hexachlorobenzene	83	U
2-Nitrophenol	208	U	Pentachlorophenol	208	U
2,4-Dimethylphenol	83	U	Dibenzothiophene	42	U
Bis(2-Chloroethoxy)Methane	83	U	Phenanthrene	42	U
Benzoic Acid	**1020**	**J**	Anthracene	83	U
2,4-Dichlorophenol	83	U	Caffeine	42	U
1,2,4-Trichlorobenzene	83	U	Carbazole	83	U
Naphthalene	83	U	Phenol, 4-Nonyl-	83	U
4-Chloroaniline	42	U	2-Methylphenanthrene	42	U
Hexachlorobutadiene	83	U	1-Methylphenanthrene	42	U
4-Chloro-3-Methylphenol	83	U	**Di-N-Butylphthalate**	**2730**	
2-Methylnaphthalene	42	U	Fluoranthene	42	U
1-Methylnaphthalene	83	U	Benzidine	416	UJ
Hexachlorocyclopentadiene	208	U	Pyrene	83	U
2,4,6-Trichlorophenol	83	U	Retene	83	U
2,4,5-Trichlorophenol	83	U	Butylbenzylphthalate	83	U
1,1'-Biphenyl	**7.5**	**J**	Benzo(a)anthracene	83	U
2-Chloronaphthalene	42	U	3,3'-Dichlorobenzidine	83	U
2,6-Dimethylnaphthalene	42	U	Chrysene	83	U
2-Nitroaniline	208	U	**Bis(2-Ethylhexyl) Phthalate**	**42**	**J**
Dimethylphthalate	83	U	Di-N-Octyl Phthalate	208	U
2,6-Dinitrotoluene	208	U	Benzo(b)fluoranthene	83	U

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8152A1 **Method:** SW8270

Project Officer: Dale Norton **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil

Date Analyzed: 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	83	U
Benzo[e]pyrene	42	U
Benzo(a)pyrene	42	U
Perylene	42	U
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	208	U
Dibenzo(a,h)anthracene	83	U
Benzo(ghi)perylene	416	U

Surrogate Recoveries

2-Fluorophenol	**107**	**%**
D5-Phenol	**100**	**%**
D4-2-Chlorophenol	**94**	**%**
1,2-Dichlorobenzene-D4	**81**	**%**
D5-Nitrobenzene	**91**	**%**
2-Fluorobiphenyl	**77**	**%**
D10-Pyrene	**89**	**%**
D14-Terphenyl	**88**	**%**

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8152A2 **Method:** SW8270

Date Prepared: 04/29/98 **Matrix:** Sediment/Soil

Project Officer: Dale Norton **Date Analyzed:** 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Pyridine	64	U	Acenaphthylene	64	U
N-Nitrosodimethylamine	64	U	3-Nitroaniline	160	U
Aniline	32	U	Acenaphthene	32	U
Phenol	**39**	**J**	2,4-Dinitrophenol	2560	U
Bis(2-Chloroethyl)Ether	64	U	4-Nitrophenol	160	U
2-Chlorophenol	64	U	1,6,7-Trimethylnaphthalene	32	U
1,3-Dichlorobenzene	64	U	Dibenzofuran	32	U
1,4-Dichlorobenzene	64	U	2,4-Dinitrotoluene	160	U
1,2-Dichlorobenzene	64	U	Diethylphthalate	64	U
Benzyl Alcohol	32	U	Fluorene	32	U
2-Methylphenol	64	U	4-Chlorophenyl-Phenylether	64	U
2,2'-Oxybis[1-chloropropane]	32	U	4-Nitroaniline	160	U
N-Nitroso-Di-N-Propylamine	64	U	4,6-Dinitro-2-Methylphenol	640	U
4-Methylphenol	**5.2**	**J**	N-Nitrosodiphenylamine	64	U
Hexachloroethane	64	U	1,2-Diphenylhydrazine	32	U
Nitrobenzene	64	U	4-Bromophenyl-Phenylether	64	U
Isophorone	64	U	Hexachlorobenzene	64	U
2-Nitrophenol	160	U	Pentachlorophenol	160	U
2,4-Dimethylphenol	64	U	Dibenzothiophene	32	U
Bis(2-Chloroethoxy)Methane	64	U	Phenanthrene	32	U
Benzoic Acid	640	U	Anthracene	64	U
2,4-Dichlorophenol	64	U	Caffeine	32	U
1,2,4-Trichlorobenzene	64	U	Carbazole	64	U
Naphthalene	64	U	Phenol, 4-Nonyl-	64	U
4-Chloroaniline	32	U	2-Methylphenanthrene	32	U
Hexachlorobutadiene	64	U	1-Methylphenanthrene	32	U
4-Chloro-3-Methylphenol	64	U	**Di-N-Butylphthalate**	**786**	
2-Methylnaphthalene	32	U	Fluoranthene	32	U
1-Methylnaphthalene	64	U	Benzidine	320	UJ
Hexachlorocyclopentadiene	160	U	Pyrene	64	U
2,4,6-Trichlorophenol	64	U	Retene	64	U
2,4,5-Trichlorophenol	64	U	Butylbenzylphthalate	64	U
1,1'-Biphenyl	**4.7**	**J**	Benzo(a)anthracene	64	U
2-Chloronaphthalene	32	U	3,3'-Dichlorobenzidine	64	U
2,6-Dimethylnaphthalene	32	U	Chrysene	64	U
2-Nitroaniline	160	U	**Bis(2-Ethylhexyl) Phthalate**	**28**	**J**
Dimethylphthalate	64	U	Di-N-Octyl Phthalate	160	U
2,6-Dinitrotoluene	160	U	Benzo(b)fluoranthene	64	U

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

BNA FOR NOAA

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8152A2 **Method:** SW8270

Project Officer: Dale Norton **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil

Date Analyzed: 05/27/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Benzo(k)fluoranthene	64	U
Benzo[e]pyrene	32	U
Benzo(a)pyrene	32	U
Perylene	32	U
3B-Coprostanol		NAF
Indeno(1,2,3-cd)pyrene	160	U
Dibenzo(a,h)anthracene	64	U
Benzo(ghi)perylene	320	U

Surrogate Recoveries

2-Fluorophenol	**71**	**%**
D5-Phenol	**66**	**%**
D4-2-Chlorophenol	**64**	**%**
1,2-Dichlorobenzene-D4	**56**	**%**
D5-Nitrobenzene	**62**	**%**
2-Fluorobiphenyl	**57**	**%**
D10-Pyrene	**65**	**%**
D14-Terphenyl	**64**	**%**

Authorized By: _____ Release Date: 7/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 **Date Received:** 04/24/98 **Method:** NOAA-TBT
Field ID: FD-8 **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride	100	J
Tributyltin Chloride	302000	E
Dibutyltin Chloride	27100	E
Monobutyltin Chloride	6620	E

Surrogate Recoveries

Tripentyltin Chloride	61	%

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 (Dilution - DIL1) **Date Received:** 04/24/98 **Method:** NOAA-TBT
Field ID: FD-8 **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride	13	J
Tributyltin Chloride	74300	E
Dibutyltin Chloride	14100	J
Monobutyltin Chloride	7750	J

Surrogate Recoveries

Tripentyltin Chloride	NC

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178090 (Dilution - DIL2) **Date Received:** 04/24/98 **Method:** NOAA-TBT
Field ID: FD-8 **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride		REJ
Tributyltin Chloride	**47800**	**J**
Dibutyltin Chloride	**9680**	**J**
Monobutyltin Chloride	**2080**	**J**

Surrogate Recoveries

Tripentyltin Chloride	**NC**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8175A1 **Method:** NOAA-TBT
Blank ID: BLNK **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/22/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride	7	U
Tributyltin Chloride	7	U
Dibutyltin Chloride	7.2	U
Monobutyltin Chloride	**17**	

Surrogate Recoveries

Tripentyltin Chloride	**94**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OBS8175A2 **Method:** NOAA-TBT
Blank ID: BLNK **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/22/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride	7	U
Tributyltin Chloride	7	U
Dibutyltin Chloride	7.2	U
Monobutyltin Chloride	**12**	**J**

Surrogate Recoveries

Tripentyltin Chloride	**109**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OCS8175A1 **Method:** NOAA-TBT
Blank ID: SBRM **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride		REJ
Tributyltin Chloride	**137**	**J**
Dibutyltin Chloride	**5.7**	**J**
Monobutyltin Chloride	**51**	**J**
Surrogate Recoveries		
Tripentyltin Chloride	**82**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OCS8175A2 **Method:** NOAA-TBT
Blank ID: SBRM **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride		REJ
Tributyltin Chloride	**147**	**J**
Dibutyltin Chloride	**5**	**J**
Monobutyltin Chloride	**50**	**J**
Surrogate Recoveries		
Tripentyltin Chloride	**90**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OCS8175A3 **Method:** NOAA-TBT
Blank ID: PCS2 **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride		REJ
Tributyltin Chloride	**2090**	**J**
Dibutyltin Chloride	**2000**	**J**
Monobutyltin Chloride	**1700**	**J**

Surrogate Recoveries

Tripentyltin Chloride	**72**	**%**

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Department of Ecology

Analysis Report for

Tri-butyl Tin

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: OCS8175A4 **Method:** NOAA-TBT
Blank ID: PCS2 **Date Prepared:** 06/24/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 07/23/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Tetrabutyltin Chloride		REJ
Tributyltin Chloride	**1850**	**J**
Dibutyltin Chloride	**2010**	**J**
Monobutyltin Chloride	**2300**	**J**

Surrogate Recoveries

Tripentyltin Chloride	**65**	**%**

Authorized By: _____ Release Date: 8/16/98 Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Hydrocarbon Identification

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Project Officer: Dale Norton
Date Reported: 07-MAY-98

Method: HYDRO-ID
Matrix: Sediment/Soil
Analyte: Hydrocarbon identification

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
*98178085		FD-3C		NC	mg/Kg ww	04/24/98	04/29/98
*98178086		FD-3D		NC	mg/Kg ww	04/24/98	04/29/98
*98178089		FD-6		NC	mg/Kg ww	04/24/98	04/29/98
OBS8119HC				NC	mg/Kg ww		04/29/98

Comments:

98178085 - Appears to be some type of lube oil

98178086 - Appears to be some type of lube oil

98178089 - Appears to be some type of lube oil

* See comments

Authorized By: Burell Release Date: 5-7-98 Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178083 **Date Collected:** 04/22/98 **Method:** SW8080
Field ID: FD-3 **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/02/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Alpha-BHC	7.7	U
Beta-BHC	7.7	U
Gamma-BHC (Lindane)	7.7	U
Delta-BHC	7.7	U
Heptachlor	7.7	U
Aldrin	7.7	U
Heptachlor Epoxide	7.7	U
Endosulfan I	7.7	U
4,4'-DDE	7.7	U
Dieldrin	7.7	U
Endrin	7.7	U
Endosulfan II	7.7	U
4,4'-DDD	7.7	U
Endrin Aldehyde		REJ
4,4'-DDT	**9.2**	**J**
Endosulfan Sulfate	7.7	U
Endrin Ketone	7.7	U
Methoxychlor	7.7	U

Surrogate Recoveries

Tetrachloro-m-xylene	**82**	**%**
Dibutylchlorendate	**90**	**%**

Authorized By: _____ Release Date: 8/18/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Sample: 98178084 **Date Collected:** 04/22/98 **Method:** SW8080
Field ID: FD-3D **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/02/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Alpha-BHC	8.5	U
Beta-BHC	8.5	U
Gamma-BHC (Lindane)	8.5	U
Delta-BHC	8.5	U
Heptachlor	8.5	U
Aldrin	8.5	U
Heptachlor Epoxide	8.5	U
Endosulfan I	8.5	U
4,4'-DDE	8.5	U
Dieldrin	8.5	U
Endrin	**2**	**J**
Endosulfan II	8.5	U
4,4'-DDD	8.5	U
Endrin Aldehyde		REJ
4,4'-DDT	**6.7**	**J**
Endosulfan Sulfate	8.5	U
Endrin Ketone	8.5	U
Methoxychlor	8.5	U

Surrogate Recoveries

Tetrachloro-m-xylene	**77**	**%**
Dibutylchlorendate	**98**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Lab ID: OBS8119A1 **Method:** SW8080
QC Type: Laboratory Method Blank **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/02/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Alpha-BHC	7.7	U
Beta-BHC	7.7	U
Gamma-BHC (Lindane)	7.7	U
Delta-BHC	7.7	U
Heptachlor	7.7	U
Aldrin	7.7	U
Heptachlor Epoxide	7.7	U
Endosulfan I	7.7	U
4,4'-DDE	7.7	U
Dieldrin	7.7	U
Endrin	7.7	U
Endosulfan II	7.7	U
4,4'-DDD	7.7	U
Endrin Aldehyde		REJ
4,4'-DDT	7.7	U
Endosulfan Sulfate	7.7	U
Endrin Ketone	7.7	U
Methoxychlor	**8.4**	**J**

Surrogate Recoveries

Tetrachloro-m-xylene	**74**	**%**
Dibutylchlorendate	**110**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Lab ID: OBS8119A2 **Method:** SW8080
QC Type: Laboratory Method Blank **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/02/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Alpha-BHC	7.7	U
Beta-BHC	7.7	U
Gamma-BHC (Lindane)	7.7	U
Delta-BHC	7.7	U
Heptachlor	7.7	U
Aldrin	7.7	U
Heptachlor Epoxide	7.7	U
Endosulfan I	7.7	U
4,4'-DDE	7.7	U
Dieldrin	7.7	U
Endrin	7.7	U
Endosulfan II	7.7	U
4,4'-DDD	7.7	U
Endrin Aldehyde		REJ
4,4'-DDT	7.7	U
Endosulfan Sulfate	7.7	U
Endrin Ketone	7.7	U
Methoxychlor	7.7	U

Surrogate Recoveries

Tetrachloro-m-xylene	**77**	**%**
Dibutylchlorendate	**112**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Lab ID: OCS8119 **Method:** SW8080
QC Type: NIST SRM 1941a **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/02/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Alpha-BHC	13	U
Beta-BHC	13	U
Gamma-BHC (Lindane)	13	U
Delta-BHC	13	U
Heptachlor	13	U
Aldrin	13	U
Heptachlor Epoxide	13	U
Endosulfan I	13	U
4,4'-DDE	**6.3**	**J**
Dieldrin	**3.3**	**J**
Endrin	13	U
Endosulfan II	13	U
4,4'-DDD	**4.9**	**J**
Endrin Aldehyde	13	U
4,4'-DDT	**1.5**	**J**
Endosulfan Sulfate	13	U
Endrin Ketone	13	U
Methoxychlor	13	U

Surrogate Recoveries

Tetrachloro-m-xylene	**86**	**%**
Dibutylchlorendate	**130**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: CMB In-line Sed. Traps **LIMS Project ID:** 1290-98

Lab ID: OFS8119PP **Method:** SW8080
QC Type: Laboratory Control Sample **Date Prepared:** 04/29/98 **Matrix:** Sediment/Soil
Project Officer: Dale Norton **Date Analyzed:** 06/02/98 **Units:** ug/Kg dw

Analyte	Result	Qualifier
Alpha-BHC	78	
Beta-BHC	67	
Gamma-BHC (Lindane)	88	
Delta-BHC	64	
Heptachlor	72	
Aldrin	91	
Heptachlor Epoxide	110	
Endosulfan I	110	
4,4'-DDE	100	
Dieldrin	100	
Endrin	84	
Endosulfan II	75	
4,4'-DDD	82	
Endrin Aldehyde	0	
4,4'-DDT	113	
Endosulfan Sulfate	72	
Endrin Ketone	128	
Methoxychlor	160	

Surrogate Recoveries

Tetrachloro-m-xylene	71	%
Dibutylchlorendate	97	%

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